

PROJECT FOR PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT **UNCONTROLLED HAZARDOUS** SUBSTANCE FACILITIES—ZONE 1

NUS CORPORATION SUPERFUND DIVISION

R-585-7-3-14

A FIELD TRIP REPORT FOR FMC BALTIMORE PREPARED UNDER

TDD NO.F3-8306-20 EPA NO. MD-17 CONTRACT NO. 68-01-6699

FOR THE .

HAZARDOUS SITE CONTROL DIVISION U.S. ENVIRONMENTAL PROTECTION AGENCY

FEBRUARY 22, 1984

NUS CORPORATION SUPERFUND DIVISION

SUBMITTED BY

TERRENCE SHANNON ENVIRON. ENGINEER

LAURA A. BOORNAZIAN AIR POLLUTION SPECIALIST **REVIEWED BY**

WILLIAM WENTWORTH ASST. MANAGER APPROVED BY

GARTH GLENN MANAGER, FIT III

Site Name: <u>FMC BALTIMORE PLANT</u> TDD No. <u>F3-8306-20</u>

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The team proceeded to Building #91, located on the north side of Patapsco Ave. The facility, formerly the pilot plant for the Tetradifon product, is currently used for "Pounce" (permethrin) production. An area of soil was observed behind the building, amidst the production plant's waste treatment area. An area of grass covered soil, containing scrub growth and small trees, was located near the building's southeast corner. An asphalt parking lot/driving area bordered the building. The area occupied by the building is bordered on three sides (north-eastwest) by three different companies. The interior of the building contained Pounce-related equipment, with the piping displaying fairly recent painting.

ORIGINAL (Red)

The team proceeded to the CERCLA-fill areas located south of Building #91 and north of Patapsco Ave. The area consisted of foundations for former acetic acid production facilities. The area was very overgrown and contained standing water, due to the previous heavy rainfall of June 19, 1983. One specific area was pointed out by Mr. Palmer as an area that FMC knew contained unknown, miscellaneous material. As far as the rest of the area, Mr. Palmer had no information.

A third CERCLA area was pointed out by Mr. Palmer, located northwest of Building #91's parking lot. The area was reportedly the former location of a tank of unknown origin and contents.

Following the completion of the inspection, personnel returned to the conference room for development/discussion of the sampling plan. Upon completion of the discussion, FIT III personnel departed the site at approximately 1330 hours.

FIT III personnel returned to the plant on June 21, 1983, to conduct sampling. Prior to the inspection, FIT III personnel were briefed on FMC safety procedures. Lines of communication, investigation protocols, and sample locations were also discussed. Personnel then proceeded to the north side of the facility (north of Patapsco Ave.). After establishment of the Command Post (CP) near Building #89, sampling was initiated.

ORIGINAL (Red)

Three bore holes were advanced on the northern, eastern, and western boundaries of the old acetic acid production area, which was reported by the plant under CERCLA. There were no signs of environmental contamination. Sample numbers M-02-01,02, and 03 were obtained.

Sampling personnel then obtained sample number M-02-04 from the bed of a railroad spur which serviced the plant. The spur was located on the plant's northeast quadrant. The material from the railroad bed consisted of a crumbly, black solid, which did not display signs of environmental contamination.

Sample number M-02-05 was obtained from the location of the storage tank, which was also reported by the plant under CERCLA. A duplicate sample, in addition to the split samples, was obtained from this station for QA/QC purposes. There was no sign of environmental contamination.

Sample numbers M-02-06 and M-02-07 were obtained from around Building #91. Sample number M-02-06 was obtained from a grass/soil area located amidst the process works for the permethrin produced at Building #91. There were no signs of obvious environmental contamination.

Sample number M-04-07 was obtained from a small lawn area located in the front of Building #91. A surface soil sample was obtained from this station. There were no signs of environmental contamination.

Sample number M-04-08 consisted of decontamination rinsate (1,1,1-trichloroethane) used to decontaminate the blender tops. This sample was also obtained in accordance with QA/QC requirements.

Upon the completion of the processing for sample number M-02-08, the CP was transferred to the plant's southern side (south of Patapsco Ave.). Sampling on the facility's south side initiated at the inactive fill/waste pond area. Sample numbers M-02-09 and M-02-10 were obtained from the eastern and western boundaries of the area. There were no signs of environmental contamination. To obtain the samples, the top layer of ground and sand was removed, and a shallow stem auger was used to obtain the samples.

ORIGINAL (Red)

An attempt was made to sample the East Gate area (#M-02-11). However, the gravel pack was too dense and a sample could not be obtained.

The sampling personnel proceeded to the former location of Building #51, adjacent to Building #34, to obtain sample numbers M-02-12 and M-02-13. Sample M-02-12 was obtained from an area located near Building #34's southeast corner. Sample M-02-13 was obtained from soil underneath a foundation for current steps located near Building #34's northeast corner. As with sample numbers M-02-09 and M-02-10, the top layers of gravel and sand were removed, then the auger was advanced to refusal. No signs of environmental contamination were noted.

A final sample, intended as a clean field blank, was obtained from a lawn located in front of Building #19. A duplicate sample, in addition to the splits, was obtained for QA/QC purposes.

All samples for dioxin analysis were processed in accordance with Document #C-585-6-3-54 (See Appendix A). Upon completion of the sampling, split samples were provided to FMC personnel under chain-of-custody. All samples were obtained, photographed, processed, documented, packaged, and shipped in accordance with accepted protocols. All solid and liquid wastes generated during the inspection were drummed and removed from site. Upon completion of the breakdown of the CP, FIT III personnel departed the site at 1815 hours.



- Photo 1-Sample location M-02-01.



Photo 2-Sample location M-02-02.



Photo 1-Sample location M-02-01.





- Photo 3-Sample location M-02-03.



Photo 4-Sample location M-02-04.

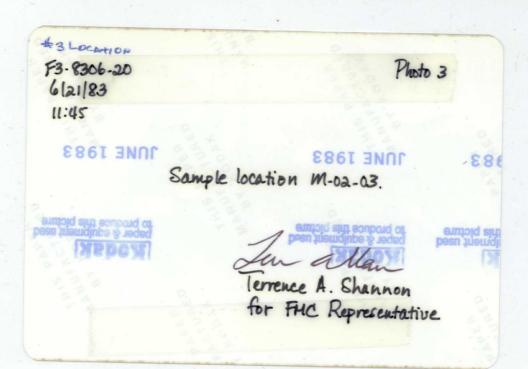


Photo 3-Sample location M-02-03.



Photo 4-Sample location M-02-04.



Photo 5-Sample location M-02-05.



Photo 6-Sample location M-02-06.

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12:44

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Sample location M-02-05

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Photo 5-Sample location M-02-05.

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1983

Photo 6

Sample location M-02-06.

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Photo 7-Sample location M-02-07.



— Photo 8-Sample location M-02-09.

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Photo 7

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Sample location M-02-07.

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Terrence A. Shannon for FMC Representative

Photo 7-Sample location M-02-07.

#9 Location

F3-8306-20 6[21]83 Photo 8

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E 1683

Sample location N-02-09.

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Terrence A. Shannon for FMC Representative

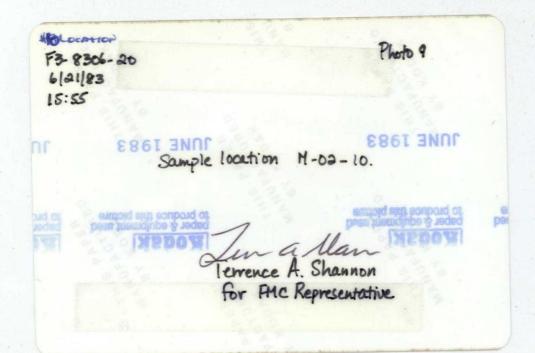
Photo 8-Sample location M-02-09.



- Photo 9-Sample location M-02-10.



Photo 10-Sample location M-02-12.



- Photo 9-Sample location M-02-10.

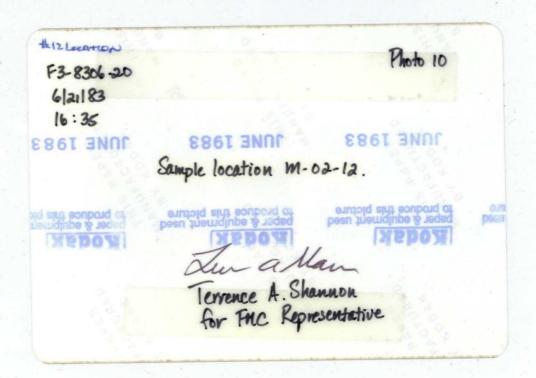




Photo 11-Sample location M-02-13.



Photo 12-Sample location M-02-14.

#13 Loomor Photo 11 F3-8306-20 6/21/83 16:51 1083 TONE 10NE 1883 10NE 1883 Sample location m-02-13. paper & equipment used to produce this picture Terrence A. Shannon for FMC Representative

Photo 11-Sample location M-02-13.

#14 LOCATION

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6/21/83

17:15

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Photo 12

10NE 1983 Sample location m-02-14.

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Terrence A. Shannon

for ALC Representative

Photo 12-Sample location M-02-14.

SECTION 1

1.0 INTRODUCTION

ORIGINAL (Red)

1.1 Authorization

NUS Corporation performed this work under Environmental Protection Agency Contract No. 68-01-6699. This specific report was prepared in accordance with Technical Directive Document No. F3-8306-20 for the FMC Inc. Baltimore Plant, located in Curtis Bay, MD.

1.2 Scope Of Work

NUS FIT III was tasked to conduct sampling of FMC's Baltimore Plant in Curtis Bay, MD. Samples were analyzed for dioxin (2,3,7,8-TCDD) and priority pollutants. The investigation was conducted by NUS personnel Terrence Shannon, Eugene Dennis, Richard Cromer, Michael Nalipinski, and David Hassrick.

1.3 Summary

In accordance with the listing of FMC's Baltimore plant in the EPA 'Dioxin Report', NUS FIT III conducted a sampling program consisting of screening for dioxin (2,3,7,8-TCDD) and organic and inorganic priority pollutants.

NUS FIT III personnel attended a number of meetings in preparation for the investigation. A meeting was held with personnel from the Center for Disease Control (CDC) in Atlanta, Georgia. In order to ensure a sampling program that would complement EPA III's and CDC's needs, discussions were held regarding the type of sampling plans (screening vs. statistical), sample locations (pipes, tanks, dust, etc.), quality assurance/control programs (performance audit, duplicate, and spiked samples), and on-site procedures (homogenization of samples, personnel protection).

In addition, a meeting of the Dioxin Work Group was attended by NUS FIT III personnel, in which administrative and technical details were finalized. Prior to initiating the on-site work, briefings were held with the individual work teams to ensure that all aspects of the investigation were performed in accordance with the newly established protocols for sample preparation and sample/personnel decontamination.

ORIGINAL (Red)

EPA III officials initially contacted FMC, Inc. with a letter requesting information related to the processing and handling of the Tetradifon ("Tedion") noted in the Dioxin report. At that time, a date was arranged for both a preliminary meeting, as well as the actual sampling.

The on-site meeting and investigation took place on June 20, 1983. The preliminary meeting was attended by personnel from NUS, FMC, EPA III, the MD WRA, and the Baltimore Dept. of Health. NUS FIT III personnel initiated the sampling of those locations decided upon by EPA III at the meeting. Samples were obtained from 12 locations on the plant property.

Sample analytical results were received on 7/25/83. The results did not detect 2,3,7,8-TCDD in any of the 12 samples taken from FMC property. However, a QA/QC check of the dioxin results indicated interferences in the results for sample number M-02-13. It should be noted that only 2,3,7,8-TCDD results are presented in this report. Results of sample analysis for priority pollutants will be forthcoming in a separate report.

SECTION 2

2.0 FIELD TRIP REPORT

2.1 Summary

ORIGINAL (Red)

Pursuant to the Technical Directive Document #F3-8306-20, site sampling of the FMC, Inc., Baltimore plant was conducted on June 21, 1983. NUS FIT III personnel who participated in the inspection included Terrence Shannon, Eugene Dennis, Richard Cromer, Michael Nalipinski, and David Hassrick (Dioxin Team "B").

The weather during the inspection was overcast, with a temperature of 70° F and winds from 0-5 mph. A slight rainfall of short duration occurred during the inspection.

Samples were obtained from twelve stations at the plant for dioxin and organic/inorganic priority pollutant analyses. Split samples were provided FMC personnel, under chain-of-custody.

2.2 Persons Contacted

2.2.1 Prior to Field Trip

All contacts prior to the on-site work with the facility were made by EPA III's representative, Neil Swanson (3AW23). NUS FIT III personnel did not have any contact with facility personnel until arriving at the site.

2.2.2 At the Site

ORIGINAL (Red)

Upon arriving at the site, a meeting was held with the following:

Peter Schaul Neil Swanson EPA, Region III 6th and Walnut St. Philadelphia, PA 19106 (215) 597-9800

Donald Senovich, FIT Manager Terrence Shannon, Engineer NUS Corporation 992 Old Eagle School Road Wayne, PA 19087 (215) 687-9510

Elkins Dahle, Jr., Director Charisse Deutch, Inspector Baltimore Bureau of Industrial Hygiene 111 N. Calvert St., Rm S-219 Baltimore, MD 21202 (301) 396-4477 Darryl Palmer, Environmental Manager Frank Scleck, Production Manager Irv Kipnis, Process Laboratory Manager Chuck Shaheen, Environmental Engineer FMC Corporation Agricultural Chemical Group 1701 E. Patapsco Ave., Box 1616 Baltimore, MD 21203 (301) 355-6400

Joseph Stang, Inspector
MD Dept of Heal th & Mental Hygiene
Office of Environmental Programs
201 W. Preston St., Rm. 2A4
Baltimore, MD 21201
(301) 383-6650

TDD Number _	8306-20	
EPA Number	HD- 17	

SAMPLE LOG Dioxin

S. Organic	tation Nw Inorganic	nber 437,8-TCDD High Hazard	Tag Number	PHASE/ CONG.	SAMPLE DESCRIPTION	DATE	TIME	ρН		LABOR	AT
	m-02-01		3-15550	Solid/Low	Facility - N side	6lai[83	1040			Envira	dy
		m-02-02	3-15718		u		un				
		m-02-03	3-14593		1		1138				
		m-02-04	3-14599		Facility - S side		1208				
		m-02-05	3-12084		Facility - N side		1237				
		M-02-06	3-12088		u		1305				
		M-02-07	3-12091		II .		1326				
		M-02-08	3-12094		ıı		1340				
		m-02-09	3-12095		Facility - S side		1523	·			•
		m-02-10	3-12098		U H		1549				
		M-0a-12	3-24054		И		1630				
		M-02-13	3- 24057		11		1648				
		m-02-14	3-24060		11		17/2		·		
		m-02-14	3-24061		Ц		1717			,	_
	M-02-15 M-03-16 M-01-01		3-24901		Performance audit	6/29/83	1630				·
			3-24902	v	Performance audit	6/29/83	1640				
			3-24064	Solid/Hi	QA Duplicate Transfer	6 21 83	1055		•		
									Page 1	-	_
									A		
											

2.4 Site Observations

ORIGINAL (Red)

FIT III personnel arrived on-site at 0900 on June 20, 1983, to attend a meeting previously arranged by EPA III representative Neil Swanson. Mr. Swanson described the screening nature of the anticipated sampling program and the analyses to be run (2,3,7,8-TCDD and organic/inorganic priority pollutants). A general discussion ensued, concerning the plant's layout and the production history of Tetradifon, the compound of concern to EPA due to its potential for dioxin contamination. The following information was elicited from the FMC personnel present at the meeting.

The total size of the plant is approximately 50 acres, with 20 acres located north of Patapsco Ave. and 30 acres located south of Patapsco Ave. Approximately 350 people are employed at the plant.

Relative to the production of Tetradifon, Building #91 was the location of the compound's pilot plant. Building #91 was reconfigured and is currently the site of "Pounce" (permethrin) production, a chemical used on cotton and tobacco. The equipment used for the Tetradifon production was either decontaminated and used elsewhere in the plant or scrapped and sold. The exact fate of this equipment was unknown.

The semiworks for the commercial production of the Tetradifon was located in Building #52 and was in operation from approximately 1960 through 1970. Building #52 was demolished, date unknown, and is currently the location of the plant's RCRA waste facility. This area is sealed with an asphalt pad.

All product generated by the pilot plant and the semiworks for Tetradifon were drummed and transported by truck. There was no railroad transport, to the best of the FMC personnel's recollection. Likewise, an incinerator constructed on the plant's property in 1968 was not used for the incineration of any Tetradifon production wastes.

ORIGINAL (Red)

Three CERCLA areas of the plant were discussed. One area was located adjacent to the old "waste-pond" area in the plant's southeast quarter. FMC personnel stated that the area, formerly a wetlands, was used for the disposal of aqueous waste from the production of Tetradifon, as well as unknown, miscellaneous materials. The pond was excavated, filled, and a storage facility was constructed on the site. The pond's contents were removed and possibly disposed of at Solley Road landfill. The area is currently capped with a sand/gravel cover. A second CERCLA area, located south of Building #91 and north of Patapsco Ave. was also used for the disposal of unknown, miscellaneous materials. It is the former location of acetic acid production facilities. A third CERCLA area, located approximately 200 feet west of Building #89, was the location of a tank of unknown contents and fate.

The plant has two runoff collection systems. One system, called the plant general system, drains the entire plant except for the 7-OH production area. The general system discharges to a POTW. The collection system for the 7-OH area discharges to the retention basin located on the plant's southern boundary. Effluent from the retention basin is discharged via an NPDES permit to the Patapsco River.

In regard to the technical aspects of the inspection, it was decided that splits of both the dioxin and priority pollutant samples would be provided FMC. Material for the dioxin analysis would be collected in the blender top, homogenized with the blender, and split. Material for the priority pollutant analysis would be collected in a stainless steel bucket, mixed with a stainless steel scoopula, and split. FMC would provide their own glassware for their split samples. Photographs of the sampling would be obtained by FMC, developed, and mailed to the NUS FIT III contact, Terrence Shannon. Finally, FMC personnel would accompany NUS FIT III personnel during all plant surveys and sampling.

Following the discussion, a walk-through of the facility was conducted. See next page.

ORIGINAL ng

The southeast section of the plant was inspected, including the retention basin, the fire water basin, the old waste pond area (near the 7-OH control room, Building #80), and a CERCLA-reported inactive fill area. Both the old waste pond area and the CERCLA fill area were covered with what appeared to be a white, 2 to 3 inch-sized gravel, with an underlying area of fine sand, which presumably was underlain by the old waste areas. There were no signs of environmental contamination in those areas.

The inspection team proceeded to the unnamed stream which bordered the eastern portion of the south part of the facility. Recent heavy rains had severely flooded this area. Access to this portion of the facility was via the east gate, which was used at one time by all contractors entering the plant.

The inspection team proceeded to the former location of Building #52, used for production of the potential dioxin contaminated product Tetradifon. The area is currently occupied by a RCRA waste storage facility and is completely covered by asphalt and gravel of the type mentioned earlier. An area of sediment accumulation was observed underneath steps on the northwest side of the area. An open drain was observed in a shallow depression area on the southwest side of the area. A railroad spur, running north/south, was located on the other side of a plant access road located immediately adjacent to the area's western side. Building #34 was located to the west of the area.

The team proceeded to the warehouse area adjacent to the plant's 2nd St. A railroad spur, embedded in a concrete causeway, was located parallel to 2nd St., next to the warehouse. The loading platform for the warehouse area was observed at the western end of the buildings. The railroad bed material could not be ascertained.

The team proceeded to Building #91, located on the north side of Patapsco Ave. The facility, formerly the pilot plant for the Tetradifon product, is currently used for "Pounce" (permethrin) production. An area of soil was observed behind the building, amidst the production plant's waste treatment area. An area of grass covered soil, containing scrub growth and small trees, was located near the building's southeast corner. An asphalt parking lot/driving area bordered the building. The area occupied by the building is bordered on three sides (north-eastwest) by three different companies. The interior of the building contained Pounce-related equipment, with the piping displaying fairly recent painting.

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A third CERCLA area was pointed out by Mr. Palmer, located northwest of Building #91's parking lot. The area was reportedly the former location of a tank of unknown origin and contents.

Following the completion of the inspection, personnel returned to the conference room for development/discussion of the sampling plan. Upon completion of the discussion, FIT III personnel departed the site at approximately 1330 hours.

Site Name: <u>FMC BALTIMORE PLANT</u> TDD No. F3-8306-20

FIT III personnel returned to the plant on June 21, 1983, to conduct sampling. Prior to the inspection, FIT III personnel were briefed on FMC safety procedures. Lines of communication, investigation protocols, and sample locations were also discussed. Personnel then proceeded to the north side of the facility (north of Patapsco Ave.). After establishment of the Command Post (CP) near Building #89, sampling was initiated.

Three bore holes were advanced on the northern, eastern, and western boundaries of the old acetic acid production area, which was reported by the plant under CERCLA. There were no signs of environmental contamination. Sample numbers M-02-01,02, and 03 were obtained.

Sampling personnel then obtained sample number M-02-04 from the bed of a railroad spur which serviced the plant. The spur was located on the plant's northeast quadrant. The material from the railroad bed consisted of a crumbly, black solid, which did not display signs of environmental contamination.

Sample number M-02-05 was obtained from the location of the storage tank, which was also reported by the plant under CERCLA. A duplicate sample, in addition to the split samples, was obtained from this station for QA/QC purposes. There was no sign of environmental contamination.

Sample numbers M-02-06 and M-02-07 were obtained from around Building #91. Sample number M-02-06 was obtained from a grass/soil area located amidst the process works for the permethrin produced at Building #91. There were no signs of obvious environmental contamination.

Sample number M-04-07 was obtained from a small lawn area located in the front of Building #91. A surface soil sample was obtained from this station. There were no signs of environmental contamination.

Sample number M-04-08 consisted of decontamination rinsate (1,1,1-trichloroethane) used to decontaminate the blender tops. This sample was also obtained in accordance with QA/QC requirements.

Site Name: <u>FMC BALTIMORE PLANT</u> TDD No. F3-8306-20

Upon the completion of the processing for sample number M-02-08, the CP was transferred to the plant's southern side (south of Patapsco Ave.). Sampling on the facility's south side initiated at the inactive fill/waste pond area. Sample numbers M-02-09 and M-02-10 were obtained from the eastern and western boundaries of the area. There were no signs of environmental contamination. To obtain the samples, the top layer of ground and sand was removed, and a shallow stem auger was used to obtain the samples.

An attempt was made to sample the East Gate area (#M-02-11). However, the gravel pack was too dense and a sample could not be obtained.

The sampling personnel proceeded to the former location of Building #51, adjacent to Building #34, to obtain sample numbers M-02-12 and M-02-13. Sample M-02-12 was obtained from an area located near Building #34's southeast corner. Sample M-02-13 was obtained from soil underneath a foundation for current steps located near Building #34's northeast corner. As with sample numbers M-02-09 and M-02-10, the top layers of gravel and sand were removed, then the auger was advanced to refusal. No signs of environmental contamination were noted.

A final sample, intended as a clean field blank, was obtained from a lawn located in front of Building #19. A duplicate sample, in addition to the splits, was obtained for QA/QC purposes.

All samples for dioxin analysis were processed in accordance with Document #C-585-6-3-54 (See Appendix A). Upon completion of the sampling, split samples were provided to FMC personnel under chain-of-custody. All samples were obtained, photographed, processed, documented, packaged, and shipped in accordance with accepted protocols. All solid and liquid wastes generated during the inspection were drummed and removed from site. Upon completion of the breakdown of the CP, FIT III personnel departed the site at 1815 hours.

SECTION 3

- 3.0 LABORATORY DATA
- 3.1 SAMPLE DATA SUMMARY

SAMPLE DATA SUMMARY TARGET COMPOUNDS

TDD Num	TARGET COMPOUNDS										Site Name Fmc Baltimore							
EPA Num	 	☐ Organic ☐ Inorganic ☐ Inorganic ☐ Inorganic ☐ Compounds Detec							Date of Sample 6-21-83									
			· 1	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				Compound				// /	S Detected					
Sample Number	Sample Description and Location	Phase	Units	\ \rac{\lambda_{\text{in}}}{\text{w}}	<u>**/</u>												Remarks	
M-02-01	Facility, North Side	SOL	blp	NP														
m-02-02		SoL.	ووه	ND														
	Facility, North Side	Sol	PPL	NO														
m-02-04	Facility, South Side	Sol	996	ND		-		· .										
m-02-05	Facility, North Side	Sal	669	NO				·										
	Facility, North Side	SOL	612	wa														
m-02-07	Facility, North Side	SOL	996	NO														
	Facility, North Side	Aq	PPB	ND				· .			`							
m-02-09	Facility, South Side	Sol	PBP	ND														
	Facility, South Side	SOL	PPP	NO														
	Facility, South Side	SOL	66 p	NO														
	Facility, South Side	SoL	pp p	NO														

NOTE: For a review of this data and non-target, tentatively identified compounds, please see the Analytical Quality Assurance section of this report.

SOL

 $[\]diamond$ Denotes results of questionable qualitative significance based upon quality assurance review of data.

3.2 Quality Assurance Review

3.2.1 Dioxin Data: Lab Case: SAS-619C

3.2.1.1 Introduction

The findings offered in this report are based upon a general review of all available dioxin sample data. Blank analysis, surrogate, matrix spike, duplicate, and performance audit results, calibration standards, and isomer separation standards were examined in detail.

3.2.1.2 Qualifiers

It is recommended that this data package be utilized only with a qualifier stating that the initial results for sample M-02-13 did not rule out the presence of 2,3,7,8-TCDD at the required detection limit of one part per billion. Several reanalyses of this sample were performed, and these results are addressed in Section 3.3 of this report.

3.2.1.3 Findings

- O Cleanup options A and D of the Region VII protocol were used in an attempt to eliminate interferences which precluded the determination of any native 2,3,7,8-TCDD and the internal standard in sample M-02-13. The sample was re-extracted and reanalyzed in order to obtain the required detection limit, and results are discussed in a separate Quality Assurance Review (Section 3.3 of this report).
- One of the two chromatographic columns used in this project did not meet the interim isomer resolution criteria established in Kansas City on July 13, 1983. However, data generated on either column is adequate to rule out the presence of indigenous 2,3,7,8-TCDD. In order to obtain accurate quantitation and confident isomer specificity, the laboratory was directed to reinject all samples having possibly positive results for 2,3,7,8-TCDD on another column which met the criteria. (The only positive samples in this case turned out to be the two performance audit samples and the laboratory matrix spike.)

3.2.1.4 Summary

The attached Quality Assurance Review has revealed chromatographic interferences in sample M-02-13 as the major area of concern. Please see the accompanying Support Documentation Appendix to this report for specifics on this Quality Assurance Review.

Report prepared by Russell J. Sloboda Kanada Shirk Date: July 25, 1983

3.3 Quality Assurance Review

3.3.1 Reanalysis of Sample M-02-13 Dioxin Data: Lab Case: SAS-619C

3.3.1.1 Introduction

The findings offered in this report are based upon a general review of all available data for three reanalyses of sample M-02-13. The data examined represent an EPA-requested low resolution GC/MS analysis, an FMC-funded/requested high-resolution GC/MS analysis of the same sample, and an FMC-funded/requested low resolution GC/MS analysis of a split portion of this sample. (The original sample was mechanically blended in the field before splitting was performed.) EPA's low resolution GC/MS analysis detected dioxin at 1.04 ug/kg, whereas the other two analyses did not find dioxin. Detection limits were 0.27 ug/kg for the high resolution analysis and 0.20 ug/kg for the FMC low resolution analysis.

3.3.1.2 Qualifiers

It is recommended that this data package be utilized only with the following qualifier statments:

- o The detection limit for the high-resolution analysis was incorrectly reported by the laboratory. The corrected limit is 0.27 ug/kg.
- o Although the existing sample data is insufficient to unambiguously determine the cause of the discrepancy between the positive and non-detected sample results, several pieces of evidence suggest that the one positive result for dioxin may be an artifact of chemical interference(s) which exhibit a response similar to that of dioxin.

3.3.1.3 Findings

- The error in the reported detection limit arises out of the interpretation of the section of the dioxin protocol which addresses calculation of detection limits. The corrected limit was calculated as 2.5 times the amount represented by the lower level interfering mass areas compared to the corresponding C13₁₂-TCDD mass area. This is different from the reported detection limit, which was calculated using the sum of the two masses 320 and 322, and which yielded a higher result due to a relatively higher interference at mass 322 versus mass 320.
- o The sample contained high level interferences which necessitated additional preparatory effort for all three laboratories. Even after cleanup, multiple interferences containing co-maximizing mass 320 and 322 peaks were observed by all laboratories. In the FMC-funded low resolution GC/MS analysis, one particular interference displayed the correct 320/322 ion ratio, but without the 257 ion or retention time characteristic of dioxin. Another interference contained all three ions 320, 322, and 257, but did not exhibit the correct 320/322 ion ratio or retention time characteristic of dioxin. (In the EPA low-resolution GC/MS analysis, dioxin was identified as a peak having the correct retention time for all three ions, and a 320/322 ion ratio within the acceptable range.)
- o Conversations with several chemists have revealed that interferences have occasionally produced artifactual low-resolution GC/MS results for dioxin. In this case, the high-resolution result should be given greater credibility due to the capability of this method to eliminate artifactual interferences that the low-resolution method cannot distinguish.
- o To be sure, the high-resolution result does not disprove the validity of the one positive low-resolution result, since a different aliquot was taken for each analysis, and the sample might not have been as homogeneous as expected from the field blending. However, even if the positive result is not artifactual, the results from the other two analyses suggest that the average level of dioxin present is less than 1.0 ppb.

ORIGINAL (Red)

Thus, in order to confidently determine if the one positive result is valid or not, the original extract would have to be reanalyzed using a partial scan or high-resolution technique. However, this analysis could be successful only if significant losses of internal standard and surrogate have not occured as a result of storage and handling of the extract.

The attached Quality Assurance Review has identified an incorrect detection limit and a possible artifactual result due to chemical interference as the major areas of concern. Please see the accompanying Support Documentation Appendix to this report for specifics on this Quality Assurance Review.

Report prepared by Russell J. Sloboda Company Date: November 18,1983

APPENDIX A

Sampling Blending Procedure

C-585-6-3-54

Samplers take sample in 1 qt. stainless steel blender cup.

Blender cup should be filled no more than 3/4 full.

Note: Attempt to avoid placing stones in the blender cup. Samplers should also break up large clumps of soil.

Sample is then returned to blending station.

Blending procedure will commence as follows:

- 1 Pulse blender five (5) times.
- 2 Invert blender cup several times and shake.
- 3 Repeat this procedure six (6) times for a total of 30 pulses.
- 4 Allow the blender to sit for two to five minutes to allow all dust to settle.

Person who is blending removes right glove to open sample jar, glove is put back on when filling the jar.

Sample will be removed from the blender cup utilizing scoopulas which will be disposed of when the sample jar has been filled.

Right glove is removed for the capping of the jar.

Remove baggie and rubber band and place in designated receptacle.

Sample jar is decontaminated with 1,1,1-trichloroethane if visual contamination is evident.

Sample is then tagged, and processed by the site leader.

Any material remaining in blender cup is disposed of in the waste receptacle.

Blender cup is deaned with soap and water and scrubbed with brush if necessary.

Blender cup is filled 1/4 to 1/2 full with soapy water and agitated (blended) for 30 seconds.

Cup is then rinsed with distilled water, alcohol, and 1,1,1-TCEa. Allow to drip dry.

Sample cup is ready to receive next sample.

APPENDIX B

FMC:Corporation

Agricultural Chemical Group 1701 East Patapsco Avenue Box 1616 Baltimore Maryland 21203 (301) 355 6400

June 29, 1983



Mr. Neil Swanson
Environmental Scientist
Waste Enforcement Section
Air and Waste Management Division (3 AW 22)
United States Environmental CERTIFIED MAIL
Protection Agency RETURN RECEIPT REQUESTED
Region III
6th and Walnut Streets
Philadelphia, PA 19106

Re: Response to EPA Region III Inquiry on Possible Formation of Dioxins

Dear Mr. Swanson:

On June 20, 1983, FMC Corporation's Agricultural Chemical Group plant in Baltimore, Maryland received a letter dated June 15, 1983 from Region III of the U. S. Environmental Protection Agency, in which EPA Region III inquired as to certain information relative to the possible formation of dioxins at FMC's Baltimore plant in the course of manufacturing and handling practices over the years involving various organic chemicals. Among other things, EPA Region III's June 15, 1983 letter requests submission within ten days of receipt of the letter of a written report on the status of discussions with EPA Region III or on other action relative to the matters set forth in the letter. By the present letter, we are providing the report thus requested. In doing so, however, we do not intend to express any opinion as to the applicability of the statutory provisions referenced in the first paragraph of EPA Region III's letter or to any other statutory requirement for such a report. In response to the information requested in Attachment II of EPA Region III's letter, we are in the process of reviewing our files. We will be in a better position to respond further to this request after this review and will be in contact with you by July 10, 1983.

On Monday, June 20, 1983, a meeting was held at the Baltimore plant involving Peter Schaul and yourself from EPA Region III, myself and other FMC representatives, and representatives from your prime contractor (NUS Corporation), the City of Baltimore Health Department, and the State of Maryland Office of Environmental Programs. At that time there was an exchange of information concerning a product, Tetradifon ("Tedion"), manufacturing at FMC's Baltimore plant

Page 2

between 1957 and 1970. During the course of the meeting, there were discussions concerning the product, its related manufacturing facilities, disposal of wastes in connection with the manufacture and handling of the product and EPA Region III's letter of June 15, 1983. The meeting concluded with a brief plant tour to identify possible locations for sampling.

On the following day, June 21, 1983, the NUS Corporation representatives returned to the plant and obtained twelve (12) split spoon core samples from various locations throughout the plant site. All samples were split with our plant laboratory personnel.

It is our understanding that NUS will analyze these samples for dioxins as well as for the 129 "priority pollutants" and that the results of such analyses will be available to us in approximately four to six weeks.

If there are questions concerning this letter, or if additional information is required, please advise me (301/355-6400, Ext. 235).

Yours very truly,

D. W. Palmer Environmental Manager

DWP:ct

cc: Elkins W. Dahle, Jr.
City of Baltimore
Health Department
Bureau of Industrial Hygiene
111 North Calvert Street
Baltimore, Maryland 21202

Art Caple Joseph Stang State of Maryland
Office of Environmental Programs
201 W. Preston Street
Baltimore, Maryland 21201

Agricultural Chemidal Group 1701 East Patapsco Avenue Box 1616 -Baltimore Maryland 21203 (301) 355 6400

July 7, 1983



Mr. Neil Swanson
Environmental Scientist
Waste Enforcement Section
Air and Waste Management Division (3AW22)
United States Environmental Protection Agency
Region III
6th and Walnut Streets
Philadelphia, PA 19106

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Re: Response to EPA Region III

Inquiry on Possible Formation of Dioxins

Dear Mr. Swanson:

This letter is to confirm my July 6th telephone conversation with Peter Schaul of EPA Region III.

Because of the difficulty in attempting to locate and review information, some of which dates back twenty-five (25) years, we have requested and Mr. Shaul has agreed to an additional ten (10) days in which to respond to the request for information contained in EPA Region III's letter of June 15, 1983.

If there are any questions in this regard, please do not hesitate to contact me.

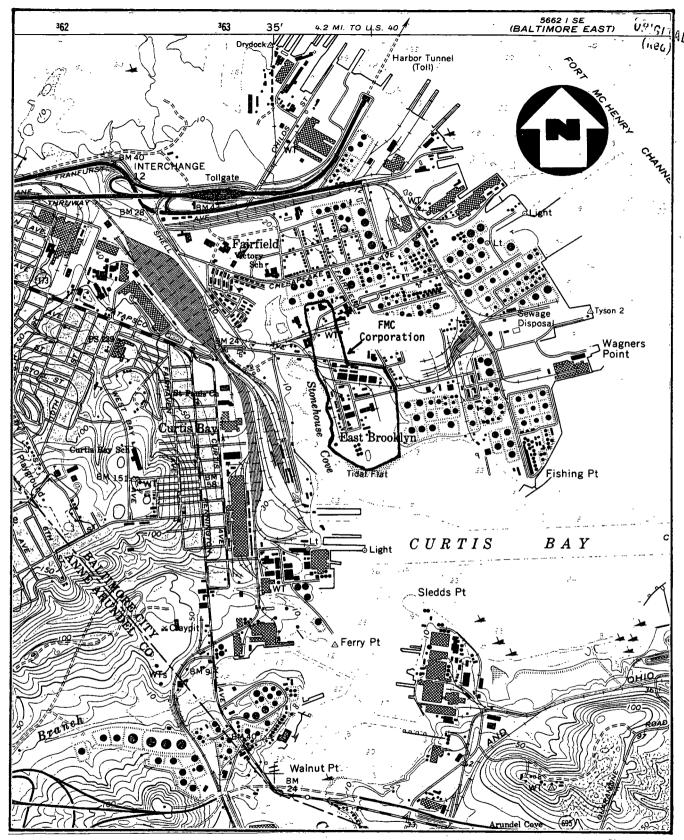
Sincerely yours,

D. W. Palmer Environmental Manager

DWP:ct

cc: Peter Schaul - EPA Region III

APPENDIX C



Source: USGS 7.5' Series Curtis Bay, MD Quadrangle

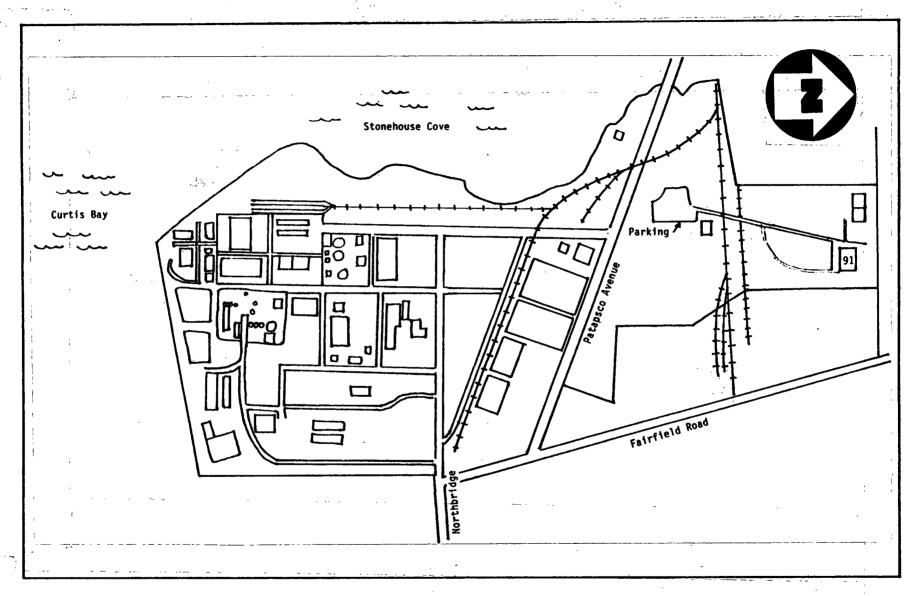
Site Location Map

FMC Corporation, Baltimore, Maryland

CORPORATION

A Halliburton Company

Scale: 1:24,000

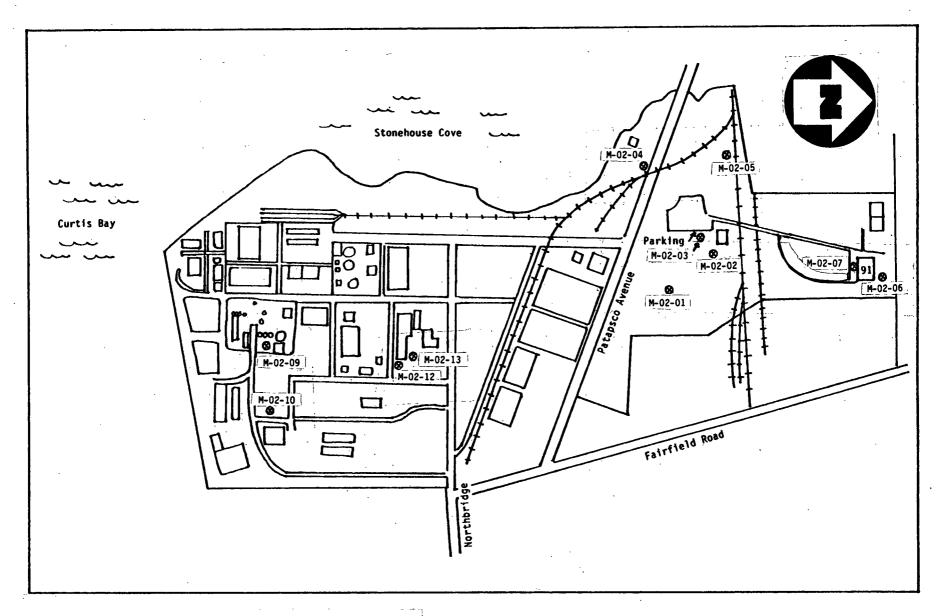


Site Sketch

FMC Corporation, Baltimore, Maryland

NOT TO SCALE



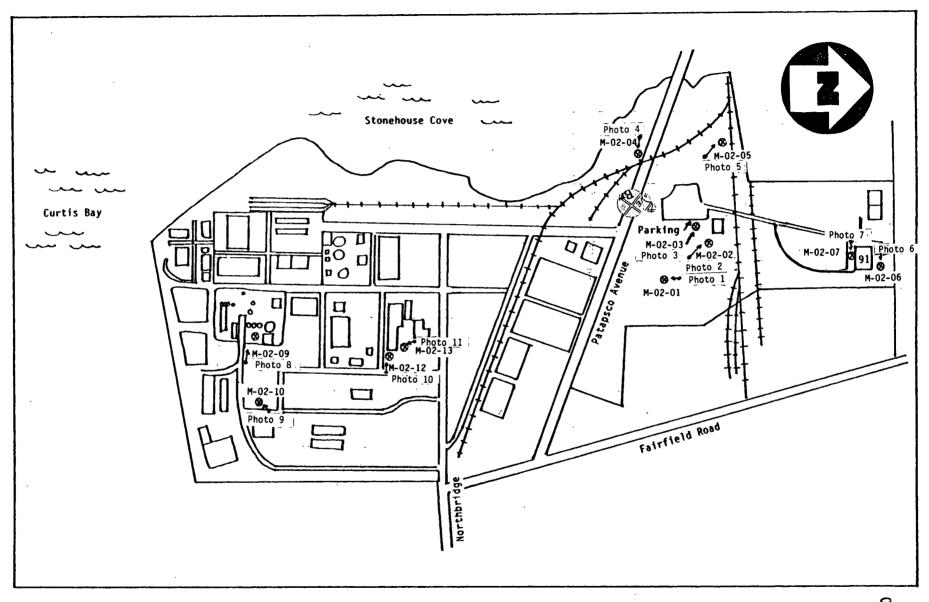


Sample Location Map

FMC Corporation, Baltimore, Maryland

NOT TO SCALE





Photograph Location Sketch

FMC Corporation, Baltimore, Maryland

CORPORATION

A Halliburton Company

APPENDIX D

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Contract No.: [Unknown]	M-c	02-09 10, 12,1	3 14 145PIKE	E, 15, 16, M	-01-01
Contract Laboratory: Envirody	ne				
Analytical Protocol : June 83 R. III	<u></u>		•	·	
Reviewer: R. Sloboda	·				
Review Date: $\frac{7/25/83}{}$				•	
The dioxin analytical data for summarized in the following table		een reviewed.	The quality assura	ance evaluati	on is
Reviewer's Evaluation*		Fractio	n		,
	2,3,7,8-TCDD	Other TCDD's	Other chlorinated dibenzodioxins	2,3,7,8-TC dibenzofurun	Other Clid
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Acceptable with exception(s)	V1				
Questionable					·
Unacceptable					·
* Definitions of the evaluation s This evaluation was based upon a ODATA COMPLETENESS BLANK ANALYSIS RESUL SURROGATE SPIKE RESULTS MATRIX SPIKE RESULTS ODUPLICATE ANALYSIS R	n analysis of th	ne review items Qual:		2	
Data review forms are attached	for each of the	review items in	ndicated above.		
Comments: ** Not Analyze	d for Duta pous spike resul	wheleon rule o	ut some, but not all	, of the other	TCDDISCHIS

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

<u>UNACCEPTABLE</u>: Data is not within established control limits.

The deficiences imply the results are not meaningful.

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Blank Analysis Results

The contaminants found in the blanks are listed below:

ORIGINAL (Red)

	•			(Red)
FRACTION	TYPE OF BLANK	SAMPLE NO.	SOURCE OF	CONTAMINANTS (concentration/DL)
Sóil	Sumple SDIL Blank	m-02-14	clean soil	TCDD (ND/DL 0.46 ug/kg)
Soil	lub soilblank	MB(soids) FRN23545	Lab	TCDD(ND/DL 0.24 ug/kg)
bonger	lub powder blank	MB(Powder) FRN 23548	Lab	TCDD(ND/DL 0.84 ug/kg)
Rinsate	1, 1, 1-trichleid- etture romate: used Juring sampling equipment decontamination		1,1,1-trichlors- ethana	TCDD(ND/DL 0.039 ug/kg rinsate)
·				•
COMMENTS:	No posit	ive samp	ele résult	from real samples.
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SURROGATE SPIKE RECOVERIES **Asterisked values are outside of QC limits

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OMMENTS: *Lab note indicates interferences: is being re-extracted and regardized.

The resulty for M-02-013 indicate that the detection limits for 2379-TRDD may

be significantly above those required (1006). (Options to and D was used on 1862-13.

but the internal strubbled and 2,378-TOD rops still had interferences after both cleanups.)

Matrix Spike Results (spiked by laboratory)

compound	original	spiked	Concer	ntration	Percent	Laboratory
·	Sample no	sample no	ADDED	REYOVERED	Recovery	Control Limite
2,3,7,8-TCDD	14-02-14	M-02-14N			. ,	Not specified
2,3,7,8-TCDD 2,3,7,8-TCDU	17-02-14	M-02-14Na	1.0 uy/kg	1.3 ug/kg	1302	Not specified
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ORIGINAL (Red)

* An asterisk indicates values outside control limits.

Comments:	Acce	ptable	recoverie	دحر	CONS	iderina.	that	no	positive	results were	
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Duplicate Analysis Results

compound	Type of duplicate (Inter/Intra-Lab)	Sample No.	Concentration	Sample Na		Relative Percent
\	(Inter/Intra-Lab)	/Lab Name		/Lab Name		Difference
37C14-2,3,7,8-TCDD	intra-lab	moz-04/	1027R	m-c2-c4D/ envirody;ie	1012R	1 12
2,3,7,8-TCDD	intra-lub	endicoglino	ND/DL . 21 mg/kg	M-02-04D/ envirodyne	ND/DL 14/4/kg	0
23.7.8-TCDD	interlab	envirodyne	ND/ DL O.OG wylky	Col Brial	Not ye	tavailable
2378-TCDD 2,378-TCDD	interlab	m-ot-ol/ envisorable	ND/DL 0.20 mg/kg	m-01-01/ Call Anal.	Not ye	t uveilable
		,				

Controllimits: Not established. Source of QC Limits:

* An asterisk indicates outliers.

Comments: Results not yet available for MO205 and MO101 analyses at

California Analytral Laboratories

Qualitative Requirements ORIGINAL	
A.l. I somer Specificity Demonstrated in Documentation? (YIN) Yes	
2. I somer Specificity Demonstrated in Documentation within	•
8 hours to all positive sample runs? (Y/N) Yes; however, Exceptions: Negative results were run only on column which	
did not separate isomero quite as well but since all positives re-run ongod columnion	الماميد وأدا
B.1. 320/322 Ion Ratio within QC Limits (.6787) for all positives?	. VERNA
Y/N Yes Exceptions None. Only positives were QC sumplies.	•
	•
C.1. 320,322,257 All maximize together (within 3 sec.)? (Y/N) Yes Exceptions None	
	_
2. SIN greater than 2.5 for each ion? (YIN) Yes Exceptions: 1/1000	
D. Retention time of surrogates and internal standard same as native ICID? (Y/N) Tes Exceptions None	
E. Confirmation Data 1. At least one confirmed per set of 24? (Y/N) Yes Exceptions Core	
2. High resolution confirmation? (Y/N) No Comments Partial scar goods and	
3. Partial scan confirmation? (IN) Yes	
-> Ton Rating: OC Limits: 320/222 6 1-87 Jumple: 0.82	
320/324 1.58 ±0.16 (1.42-1.74) 1.80 75	
257/259	
117/176	
160, 161, 194, 196, 257, 259, 320, 322, 324 All present except mass 160.*	•
Comments Only outliers are denoted with an asterisk above. The partial scan confirmation is of confident matching quality.	
Town 13 of confidence from the desired	

Calibro	tion Stai	ndards					· -:	
Calibration data provided for 3 concer	ntention	levels	2 (V/N) 40	5			
Exceptions: None	anzi ion	ic vers		<u>/</u>		· · 	ORIGINAL	
	**************************************						(Red)	
Linearity verified within working re	100e? (RI	8F< 10	2 RSD) Yes	•			
Exceptions: None	J		.[,					
Calibration Check data provided for a	II Samole	runs	7 (Y/N	1) Ye				
Exceptions: None								
Check standard RRF's within ± 10% of	- multile	vel ca	libratio	ons?(Y/N	Yes		
Exceptions: None								
							<u> </u>	
Average RRF from calibration used in	all calcul	ations	2(Y/N)	Ye.5				
Exceptions: None								
· · · · · · · · · · · · · · · · · · ·						•		
Performance	i - Δ. 1.1	P	14_	•				
1 errormano	ce nualt	. nesi	1115			•		
Source of performance audit samp Date prepared: 6/28/83 Shelf Life	Jes: Reg.	30-14	EPAS	الح و لأناه	ncled	by Dr. Kleve,	Un-Newada, for	EMSL-LV
Date prepared: 6/28/83 Shelf Life	(Ifapalic	able):	NA	Mat	rix: :	Soil	•	
Interferents Added: None								
			·					
eference Analysis: None available a	# Mis tim	2. Rpaid	ON THE	ish une	5 400	roximately 2	ppb.	
Compound		.						
mean value								
number of measurements								
standard deviation		<u> </u>						
				·			· .	
Performance Audit Sample Results:						·		
<u> </u>		<u> </u>	(Ref					···,
Sample no. :			M-c2-15					1
compound:		2378		2378				
concentration: (uy/kg)	3.3	3.1	3.6	3.4				
mean value of auditoxis (this batch):			-				`	
this lab's preceeding mean (last botch):			NE +	NET			<u> </u>	
		NE≠	NE *	NE #				
2 580) control Limits for consecutive authors:	NE #	NE #	NE #	NE +				
relative percent difference		1		ĺ				
(RPD) for (this batch) auditoric:	8.7%	-	9.2%	-				
RPD for this lab's last batch:	NE +	NE #	NE+	NEX				
(1.960) control limits for RPD (this butch)	: NE F	この中	このサ	NE#				
(2.580) control limits for RPD consecutive		NE#	NE#	NE+				
*An asterisk indicates values t	pevand 1	96.5	tandard	deviat	ions	from the	mean.	
* * A double asterisk indicates								an.
Comments: NE = Not yet esta	blished. T	hia res	ult ser	ies u	as 11	+ First	received t	êc -
this batch of portarnance que								
results were encountered in the	e real	sa nulo	a arvi	21/16	pertor	mance au-	y + sample	2.2-
were positively detected and ex	pected to	be no	ar de	tection	Livni	-) . CAE	Car then	Jose.
assume valid method performence	Whyno n	ll oth	en indi	ica tors	Such	ide surro	acto rere	verica)
one in control.					(· ·	7	
							•	

Contract No.: Lookann Contract Laboratory: Envirodone Contract Contract Contr	ROJECT NAME: FINC Pericular DD NO: F3-8306-20				N:	The second of
Contract No.: Lukneun Contract Laboratory: Enwiredyne Indyfiel Professor: July 13 RUIT-meno Leviewer: Q Slobda Leview Date: 10/25/pD The dioxin = analytical data for this case has been reviewed. The quality assurance evaluation is fraction Leviewer's Evaluation* Fraction Acceptable Acceptable Acceptable Acceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: QDATA COMPLETENESS QBLANK ANALYSIS RESULTS QBLANK ANALYSIS RESULTS QMATRIX SPIKE RESULTS QMATRIX SPIKE RESULTS QBUPLICATE ANALYSIS RESULTS QCALCULATION CHECKS Data review forms are attached for each of the review items indicated above.		QUALITY AS DIOXIN ANAL	SURANCE RE YSIS LAB DAT	VIEW OF TA PACKAGE		
Contract Laboratory: Envired ne maly field frotood : July 33 Rull + prepo (eviewer: Q S lobala (eview Date: 10/25/85) The dioxin = analytical data for this case has been reviewed. The quality assurance evaluation is unmarized in the following table: Reviewer's Evaluation* Fraction Acceptable Acceptable Acceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OYMATRIX SPIKE RESULTS OYMATRIX SPIKE RESULTS OYMATRIX SPIKE RESULTS OF CALCULATION CHECKS		<u> 619C</u> Apr	olicable Sampl	e No's.: M-02-	-13 (R	eanalysis
The dioxin 2 analytical data for this case has been reviewed. The quality assurance evaluation is unmarized in the following table: Reviewer's Evaluation* Fraction 237.8-TCDD Other CDD's Other chloringhed diben to furn plant above. Acceptable Acceptable Acceptable Acceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OSURROGATE SPIKE RESULTS OMATRIX SPIKE RESULTS OMATRIX SPIKE RESULTS ODUPLICATE ANALYSIS of the review items indicated above.	Contract Laboratory: Enviredy Chalytical Protocol: July 18 R.					
Reviewer's Evaluation* 2.37.8-TEDD	Review Date: 10/25 /83					<u> </u>
Acceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OF CALIBRATION STANDARDS OSURROGATE SPIKE RESULTS OF MATRIX SPIKE RESULTS OF CALCULATION CHECKS OBLANK ANALYSIS RESULTS OF CALCULATION CHECKS OBLANK ANALYSIS RESULTS OF CALCULATION CHECKS	The dioxin analytical data for turnmarized in the following tab	this case has bee	n reviewed.	The quality assura	ince evaluat	ion is
Acceptable Acceptable Acceptable with exception(s) Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OF SURROGATE SPIKE RESULTS OMATRIX SPIKE RESULTS OMATRIX SPIKE RESULTS OBUPLICATE ANALYSIS RESULTS	Reviewer's Evaluation*		Fractio	n		
Questionable Unacceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OSURROGATE SPIKE RESULTS OMATRIX SPIKE RESULTS OMATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS		2,37,8-TCDD	Other TCDD's		2,3,7, 8-IC dibentofuran	Other Cl?
Destionable Unacceptable Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OF CALIBRATION STANDARDS OSURROGATE SPIKE RESULTS OF PERFORMANCE AUDIT RESULTS OF MATRIX SPIKE RESULTS OF CALCULATION CHECKS ODUPLICATE ANALYSIS RESULTS OBLICATE ANALYSIS RESULTS OBLICATE ANALYSIS RESULTS OBLICATE ANALYSIS RESULTS	Acceptable		Notunalyzed			
Definitions of the evaluation score categories are listed on next page. This evaluation was based upon an analysis of the review items indicated below: ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OBLANK ANALYSIS RESULTS OF ERFORMANCE AUDIT RESULTS OF MATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS OBLANK ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS	Acceptable with exception(s)	1				
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ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OSURROGATE SPIKE RESULTS OMATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE Analysis results Oduplicated analysis results	Definitions of the evaluation	score categories	are listed on n	ext page.		
ODATA COMPLETENESS OBLANK ANALYSIS RESULTS OSURROGATE SPIKE RESULTS OMATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE ANALYSIS RESULTS ODUPLICATE Analysis results Oduplicated analysis results	This evaluation was based upon	an analysis of the	review items	indicated below:	•	• . • .
OBLANK ANALYSIS RESULTS OF PERFORMANCE AUDIT RESULTS OMATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS Data review forms are attached for each of the review items indicated above.			- ,		NTS	
SURROGATE SPIKE RESULTS OPERFORMANCE AUDIT RESULTS OCALCULATION CHECKS ODUPLICATE ANALYSIS RESULTS Data review forms are attached for each of the review items indicated above.		LTS				
MATRIX SPIKE RESULTS ODUPLICATE ANALYSIS RESULTS Data review forms are attached for each of the review items indicated above.						
Data review forms are attached for each of the review items indicated above.			O CALC	ULATION CHECKS	,	
	ODUPLICATE ANALYSIS F	RESULTS		1.		
comments: 1 Please see qualitative requirements. Only one sample from s. tempes truction	Data review forms are attached	ifor each of the	review items i	ndicated above.		
Comments: 1 Please see qualitative requirements. Only one sample trom s. terrous truction				1	a C 4	
	Comments: Pleuse see	qualitative 1	<u>equirement</u>	C5. Unly one Samp	METION S. TEIN	yestiyaTien 1

positive. A ! though the Sample result suggests the presence of TCDD. The tellowing evidence

Suggests that TCDD result may be artifactual: (1) 2 other labs get a registive TCDD result, with detection

Timits of 0.2 and 0.27 ppb. One lab was a high resolution lab. (2) Coleuting 320 and 322 interference, and isolated 257

response seen in all analyses. The 320/322 ratio was correct for one of the peaks in the March analysis subject area

Separated from the TCD retention window. (3) Conversations with Region TEEL Epischemist fragelo (asseen, Cal. finelytical chemist flavor flavor and Battelle Hireschiten Gelmschenist A. Fred De Roos indicate that artifactual TCD)

chemist/fissibilit Buil Taylor, and Rattelle Hiresolution actins chemist Differ De Roos inclicate that affirched ICID results do occasionably occur, although identity of the interferent cannot be eleterimized except perlups by full or partial scan Reanalysis of the original positive extract after reconstitution and extreme concentration.

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits.

The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

UNACCEPTABLE: Data is not within established control limits.

The deficiences imply the results are not meaningful.

LAB I.D. NO. (FRN No.)	Ac2-13			70.严重争,	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	100	Ty • Mark Ty	,				
LAB I.D. NO. (FRN No.)			a paletin	1	a Ababa	State of the second	server of			OLAT SE	1	Town
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INSTRUMENT I.D. NO.						\$43#4Q	高さり	ا ماريو ساريد	a di di di		.	T
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3 PT. CALIB. MIDOROS.	٠٠ ·					17					1	:
DAILY CALIB. RF/AMTS	✓										1	
	1	A STA		WAY S	ASS.	-					<u> </u>	_
	<u></u>				FAME yes		1.1	. ,	•			· ;
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EXTRACTION WT.	V			* * *	2 tong to	٠.				1	.1	
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CALCULATION VOLUMES	<u>ソ</u>						·				!	<u> </u>
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HIGH RESOLUTION PATA											<u> </u>	<u>:</u>
LAB SPIKE RECOVERY	100		rmed.			d march	age but	Region	II bate	resul	given ve	-fally
THE DUPLICATE -	Not	Perfor	med.	le le		زر زر	((<i>(</i> ((! ((<u>(Ĉ</u>
LAB BLANK -			: batch					1926uf	Priside	el verb	ally	<u>:</u>
PERFORMANCE AUDIT SPL.		analyz	ورا سام	h this	project:	ample.				<u> </u>	<u> </u>	
INTER-LAB. DUPLICATE	1	Ü	1(l(4	u				<u>i</u>		<u>:</u>
SAMPLE BLANK	U	[1	11	11	(((1			<u> </u>	<u> </u>	1	<u> </u>
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MS = conversation up Earl Housen on 10/3/83												ز
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indicates provious run was ND w/DL=0.21.	·								Ì			1
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Blank Analysis Results

The contaminants found in the blanks are listed below:

ORIGINAL (Red)

FRACTION	TYPE OF BLANK	SAMPLE NO.	SOURCE OF water/soil	CONTAMINANTS (concentration/DL)
TCOV	Lab Blank 150 Region VIII Samples	?		ND (DL=0.08 by /kg)
		L .		

Surre	ogate ound name	25:11:52:	3									RIG NAL
QC	LaboratoryCLI EPA Action: Source:	60-140	Ref:	Ref.	Ref:			Ref:	Ref.	Ref:	Ref.	Ref.
ATER VATER	EPA ACTION: Source:			Ref.	Ref	M.+:	Sample na	Ref.	Ref.	Ref:	Ref.	R e f.
Matrix Sail	Sample na.	802		1 27 (2) (A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		I MILLY	Odinbis II o					
erena Liter er	andro skriven de ter State trasleten mega	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	oskis . Pijskin									
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संब्रीकृत्याचित्रक स्टार्टिक स्ट्री					*						<u>.</u>	-
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So	urce of QC	 Limit	s: Re	f.1:	Septembe	- '83 R	VII protocol		1	į		1
	MENTS:		to the	T. 2.	very						· · · · · · · · · · · · · · · · · · ·	

Matrix Spike Results (spiked by laboratory)

compound	original	spiked	Concer	itration		RELATIVE	LA BORATORY CONTROL	/ CONTRO	7
	Sample no	Sample no	ADDED	FOUND	UNSPIKED	RECOVERY		LIMITS	
2,378-700	?	?	1.0pgb			t Ari aris			ORIGIN
	Santa and	建筑建			美国城市		- 第二十二十二		(Red
		SPECIE			深刻的	建 原始	્રકો જેફ્ફોફેટર્ન <i>ે</i> જ	ed September	
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						राज्याती पर्वा	- 1. ""		
	建				V. Tu	438. P. P. L.			
	363 (BASSA)			學的學		و المؤدي	:		
	rayar in rayayayayaya rayar inga magalayay		STEPPER.						

* An asterisk indicates values outside control limits.

Comments: 10/3 Conversation w/ Dr. Earl Honson: Me	an of	25	oikes	was 7273
Relative Recovery Sample was run along with	a			shiament.
	-			
	,			
THE REPORT OF THE PARTY OF THE				

Duplicate Analysis Results

	compound	Type of duplicate (Inter/Intra-Lab)	/Lab Name	Concentration	/Lab Name		Relative Percent Difference
•	2,379-7288	interlab	Enwindere	1.04 ppb	Bittela MOZ-B/	NO/PL 0.23 pt	200%
		interlat	split of mozing	NV/12 0,2000	FORINGINE	1.04,006	7.00%
- 7	2,37,8-7CDD	intralab	Splitof MOZ-13/	NP/ILOZEPA	ANITOFMOZ-13/ PEAD	NO/46	0%
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			l			
Controllimit	5:	_Source of	QC Limits:			
* An asteri Comments: (sk Indicates	outliers.	Enviral CUM MASA	lyne but	h QC	Sunsler
run in due	dicate, and	5.8 and 5.	7 pob found	I'm those	analyses.)
Enviroidy	ne was only la	6 to obtain	a positive regult	for this	sumple.	
Buttelle Symple in	15 Same, Sumoke un	Environ EPA	Sunol= # mon-13.	MEAD'S	ample 4:05	a split of
Buttelle sumple in the same samp	2, but sample w	is homogen	vited before split	things	•	•

Qualitative	ORICHNAL (Red)	
A.l. Isomer 2.Isomer 8 haus	Specificity Demonstrated in Documentation? (Y/N) Yes Specificity: Demonstrated in Documentation within to all positive sample runs? (Y/N) xceptions:	
C. 320,32	Ion Ratio within QC Limits (-6787) For all positives? Exceptions 0.66923 is Slightly below 0.67. In positive results have been seen before which one the bordenline of accriteries. 2,257 All maximize together (within 3 seconds)? (Y/N) Yes ns None	
2. 5/N gr	eater than 25 for each ion? (YIN) Yes Exceptions: None	
Di Retention to	me of surrogates and internal standard same as native TCD? Exceptions Nore	
E. Confirmat 1. At least	one confirmed per set of 24? (Y/N) No Exceptions.	
3. Partial Sca	lution confirmation? (Y/N) Yes Comments High resolution results. TCDD not present with a detection limit of 0,27 pob. a separate extraction was performed, so if sample not homogeneous this a not invalidate result for low resolutions: QC Limits: 320/322	doe

257/259
194/196

160, 161, 194, 196, 257, 259, 320, 322, 324

Comments Only are positive reported for the site muestination.

Although no reason has been established the same sample oralized by Hi-Resolution did not show TCDD. In addition, a split sample did not show TCDD. In addition, a split sample did not show TCDD. In addition, a split sample did not show TCDD. In addition, a split sample did not show TCDD. In addition, a split sample did not show the presence of didnin with a detection limit of a capab at another lab.

This same are a series of didning the first labeliance.

seen, st is possible that chromapyraphie interferences produced an artifactual result

<u>Calibration</u> Standards

angan di penghapan di dikana. Na	ા પ્રાથમિક કરિયો કે જિલ્લા છે. તે કરિયો કરિયો કે મોર્ટિયો કે કરિયો કરિયો કે મોર્ટિયો કે માટે કે માટે કે માટે ક	તું કે જાઈને છે. જો કે નિવા કરીના ફોર્ટ ફોર્ટ ફોર્ટ કરો. જો ફોર્સ કે સીધી કરો હતા કર્યા હતા કરો છે. જો હો	Stage 18 6 Tel. 1 (1974) Tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 tell 1 t	eta kira kira ya Afrika di Historia	(Red)
Exceptions	ified within	working range	? (RRF<10% RSD)	Yes (6.9% RS)	· · · · · · · · · · · · · · · · · · ·
alibration Ch Exceptions:		ided for all s	ample runs? (Y/N) Yes vallere kekseks også ganderske kereres også søksekse	
beck Standar Exceptions:	RRF3 within	±10% of mu straded within	ultilevel calibration 8 nouna previous	ns? (Y/N) fist a not	icable
tverage RRE: Exceptions:	None	n used in all c	alculations?(YM)	405	
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	INSTRUMENT TOPOUT PIER			RESPONSE FACTORS:	
	ng, there is no state of the efficiency		8/25 17:35	0.78 . 1.25	multi-Le
to the same of the state of	(1999) (1994) (1994) (1994) Burthard (1994) (1994) (1994) Maria (1994) (1994) (1994)	<i>+</i> 379	8/25 18:11 4/25 18:53	0.39 1.28	to to
	er en skriver i de skriver w		8/2< 19:26	<25% Vizibu	Isoma Si
Calculation -02-13: /87	(hack tor 2+130) 25 1+328) 10.41	8233	tt:	A 5087	
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Calculation	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	
Calculation -02-13: /87	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	
Calculation	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	
Calculation -02-13: /87	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	
Calculation -02-13: /87	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	
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Calculation	(hack tor 2+130) 25 1+328) 10.41	p-situe resu 1.04 1.8233 =	sti:	0.8897	

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	QUALITY A. M DIOXIM ANAL	SSURANCE RE YSIS LAB DA1	VIEW OF GC/MS TA PACKAGE		ORIGINAL (Red)
ase No./SAS No.: Not EPA Fu	J.T	nlicable Sampl	e No's.: 13,228	[FMC Spli	IJ.
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inalytical Protocol : EPARTUL/Hi	-Rez. Adopted			ja i sakkatan et	sk Alberta
Leviewer: R. Sloboda					
leview Date:				e depending to	
The dioxin-sanalytical data for ummarized in the following tab	this case has be			ance evaluati	ion is
Reviewer's Evaluation*		Fractio	n		
	2,37,8-TCDD	Other TCDD's	Other chlorinated dibenzodloxins	2,3,7, 8-JC dibentofunan	Other C dibenzo fun
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ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits.

The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

<u>UNACCEPTABLE</u>: Data is not within established control limits.

The deficiences imply the results are not meaningful.

ITCDD DATA COMPLETENESS CHECKLIST

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The contaminants found in the blanks are listed below:

Lab 2,3,7,8-7010 (0.01 mg/kg)	RACTION	TYPE OF BLANK	SAMPLE NO.	SOURCE OF	CONTAMINANTS (concentration/DL)
37.5-RO methal PAB		and the state of t		of the war think with the court of the	2,3,7,8-7CD (0.0/kg)
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IMMENTS: Lab Claims contamination when to 12 16 curryover Tran	previous	run. Ma	vever, prei	11 Dus run da	tu ans not sucled in package)
previous run. Mowever, previous run data and not included in package)	No al	Heat on wa	lidity of	duta.	
previous run. Movemen, previous run data and not included in package)	10		.///		
previous run. (However, previous run data suns not included in package) No effect on validity of duta.	•				
previous run. Movemen, previous run data and not included in package)					
previous run. Movemen, previous run data and not included in package)	``				

Surr	ogate ound name	2688372	8)		1	1					ORIGINA (Wed)		
QC LIMIT	tical Fraction: LaboratoryCLE S EPA Actron:	60-140									2.5	Ref.	
OC IMIK	LaboratoryC.L.	Ref.	Ref.	KeT.	Ref.			Ref.	Ref.	Ref.	Ref.	ner.	
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ii V alitya Saabaranaa	Nemal Blunk	119	ন ন্তুলিক নেটা ভালুকালাট্যক্র	ng vezen Pegasitek	ediasii t	 Autopolicy Services 		-	#	2	<u> </u>	1	1
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Matrix Spike Results (spiked by laboratory)

Compound	original	spiked	Concent			RELATIVE	LA BORATO CONTROL	RY C	EPA ONTROI	RIGINAL
	Sample no	Samole no	ADDED	FOUND	UNSPIKED	RECOVERY	LIMITS			(Red)
2,3,7,8-TCN)			1.87		ND	84%	Note	5/26/	Bred	
		******		187.46			e general (negative). Para Maria			
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Comments:										•
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compound	Type of	dunlicate	Samle Na	Con	centration	 Sample N	ka co	one.	Relati	
compound	Type of (Inter/In	dunlicate	Samle Na	Con	centration	 Sample N	la Co	orc.	Relati Diff	erence
2,3,7,8-7200 ·	interla	dunlicate	Samle Na	Con	centration	 Sample N	la Co	orc.	Relati	erence 0%
237,8-7CW	interla	duplicate ntra-Lab)		Con NE/DL NE/DL	centration	Sample M /Lab No M=22-13 582 M=EMD M=02-13 582	ine lity Nij/	10.20	Diff.	erence 0%
2,3,7,8-7200 ·	interla	duplicate ntra-Lab)	Samle Na	Con NE/DL NE/DL	centration	 Sample N	ine lity Nij/	10.20	Diff.	erence 0%
237,8-7CW	interla	duplicate ntra-Lab)	Samle Na	Con NE/DL NE/DL	centration	Sample M /Lab No M=22-13 582 M=EMD M=02-13 582	ine lity Nij/	10.20	Diff.	erence 0%
237,8-7CW	interla	duplicate ntra-Lab)	Samle Na	Con NE/DL NE/DL	centration	Sample M /Lab No M=22-13 582 M=EMD M=02-13 582	ine lity Nij/	10.20	Diff.	erence 0%
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2,3,7,8-7C00 2,3,7,8-7C00 2,3,7,8-7C00	interla	duplicate ntra-Lab)	Samle Na	Con NE/DL NE/DL	centration	Sample M /Lab No M=22-13 582 M=EMD M=02-13 582	ine lity Nij/	10.20	Diff.	erence 0%
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2,3,7,8-7200 · 2,3,7,8-7200 · 2,3,7,8-7200 · 2,3,7,8-7200	interla interla interla	duplicate tra-Lab	Sample Na. /Lab Nam model 13 specific model 14 s	Con NE/DL NE/DL NE/DL	centration O.27 and O.70 and	Sample M /Lab No M=22-13 582 M=EMD M=02-13 582	ine lity Nij/	10.20	Diff.	erence 0%
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Controllimi ** An aste	interlation interlations in terms of the later of the lat	duplicate tra-Lab	Sample Na. /Lab Name 132-132-134 Mg Marce of whiters.	Con NE/DL NE/DL NE/DL NE/DL	centration 0.27 mb 0.70 mb 0.27 mb	Sample Ne /Lab Ne /Lab Ne /Lab Ne /Lab Ne // Ensiste //	me it with with me i.o'	1020 1020 1006	Diffi (2	erence 0% 0% 00%
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Qualitative Requirements
A.l. I somer Specificity Demonstrated in Documentation? (Y/N) /es 2.I somer Specificity: Demonstrated in Documentation within (8 hours to all positive sample runs? (Y/N) Exceptions:
B.L. 320/322 Ion Ratio within QC Limits (67-87) for all positives? Y/N Yes Exceptions Only positives was spike and posstanding audit somple.
C. [. 320,322,257 All maximize together (within 3 seconds)? (Y/N) Yes Exceptions None. Difficult to determine since retention times not printed an chromatograms. Judged by peak will's versus apax separation. 2. SIN greater than 25 for each ion? (YIN) Yes Exceptions: None
D. Retention time of surrogates and internal standard same as native TCD? (Y/N) Yes Exceptions Same of (C.1.) above. E. Confirmation Data 1. At least one confirmed per set of 24? (Y/N) Yes Exceptions.
2. High-resolution confirmation? (Y/N) Yes Comments All analyses were performed by Hi-Resolution GC/MS. Verbal Conservation with Dr. Fred Verbos on 11/14 indicate Resolution at mass 320 was about 30 mmu arguents
3. Partial Scan confirmation? ((N) No. → Ion Ratios: QC Limits: 320/322 320/324 257/259 194/196
Comments Partial scan confirmation could perhaps be reformed on Environing extract to determine what artifact caused. The apparent TOD peak in their low resolution unalysis of MOZ-13. Extract may no longer be walke, though, so success is not yourseled.
- Resolution was good enough to distroyish between 1 sulfur and 2 oxygen in mw of 320 nons

<u>Calibration</u> Standards

Calibration dot	a provided fo	or 3 concentral	ion levels? (Y/N)		
Exceptions:	Mu Mu	Hi-lack calibratia	run beleve instead o	Latter charles Standa	od!!i
House House	ver Since sam	she of interest i	uas No, no effect	on validity of dotas	
Linearity ver	Itied within	working range	? (RRF<10% RSD)	<u> </u>	
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Calculation Check :

reported value colculated value 3.47 3.47

102-16: (8750.35+11533.43) 2.5 (Berlinmance Auclit) (6479.87+8283.64) (10.4 9.96

(Detection Limit)

0.274 pb D.L. + C.83 pb D.L.

The discrepancy in the calculated versus reported detection limits arises out of the interpretation of the section of the dioxin protocol which addresses calculation of detection limits. Two chemists, Paul Taylor, PHD., President of Cal. Analytical, and Angelo Carasea, Region VII EPA contributing author of the protocol; agreed with this reviewer in the tollowing interpretation: When interfering peaks greater than 2.5 times. The noise-level are present in the 237,8-TCDD retention window for both masses 320 and 322, and if one interference is Significantly larger than the other, them the detection limit can be stated (conservatively) as 2.5 times the amount calculated by the lower level interfering mass area and the corresponding Ciz-ToD mass area. (This is different than the reported detection limit, which was calculated using The sum of the two masses 320 and 322, and which yielded a higher result due to a relatively higher interference at mass 322 versus mass 320.) Mass chromatograms of this sample have been attached to illustrate the observed phenomena.

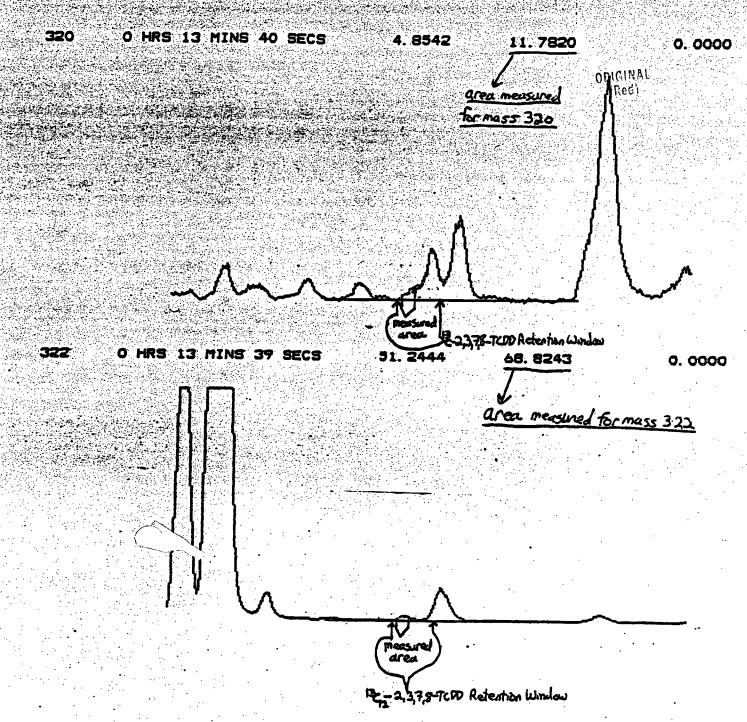


FIGURE 5-A. SELECTED ION CURRENT TRACE FOR m/z 320 AND m/z 322 FOR SAMPLE M-02-13

DD NOt F3-830G-20	<u>tta</u> d		EPA SI REGIO	ITE NO.: M	-0 <i>L</i>
	QUALITY AS DIOXIM: ANAL	SSURANCE RI YSIS LAB DA'		ORIGINA (Red)	
ase No./SAS No.: Not EPA fo	adel AD	plicable Sampl	e No's.: M	cal Comou K	hein
Contract No.:	11 T	imple 1322	e No's.: M	- split su	made et
Contract Laboratorys Mead Co	equ/chem 1	n-02-13.		far Edwirthion	
Analytical Protocol : Rogues VII so	il dioxb		建建建设设施		
Revieweri R.Slobala					
Review Date: U/15/83			edrica odljištviki delikacija (b. 1974). Sliževiki se prostova (b. 1974).		
The dioxins analytical data for unmarized in the following table leviewer's Evaluation*		en reviewed. Fractio		unce evaluat	ion is
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	for each of the	raviau Itame I	ndicated above	·	•
) ata review forms are attached	tor each of the	• • • • • • • • • • • • • • • • • • • •			

ACCEPTABLE: Data is within established control limits, or the data which is outside established control limits does not affect the validity of the analytical results.

ACCEPTABLE WITH EXCEPTION(S): Data is not completely within established control limits. The deficiences are identified and specific data is still valid, given certain qualifications which are listed below.

QUESTIONABLE: Data is not within established control limits.

The deficiences bring the validity of the entire data set into question. However, the data validity is neither proved nor disproved by the available information.

<u>UNACCEPTABLE</u>: Data is not within established control limits.

The deficiences imply the results are not meaningful.

TCDD DATA COMPLETENESS CHECKLIST

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Blank Analysis Results

ORIGINAL (Red)

The contaminants found in the blanks are listed below:

FRACTION	TYPE OF BLANK	SAMPLE NO.	SOURCE OF	CONTAMINANTS (concentration/DL)
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			1966年9日本機器は147 1967年(1976年) 1976年1	
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COMMENTS:	100 0.12	nk lesulls	provided	but not important since
Sam	ple resul	to were no	in-detected.	
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Surro compo	gate und name	3 Charitan										
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QC ·	Laboratory C.L.	rer.	1161.	. nei								
I TMTTC.	EPA ACTION:	43.44		41,55	47, 17.							
	Sample no.	Ref.	Ref.	Ref.	Ref	Matrix	Sample na	Ret.	Ref	Ref.	Ref.	Ref.
Soil	mo 2-13 #1	*1	315 H	Torse of					-	1	-	1
Soil	1-02-13 #2	**	1 2 2	Î	*					S S	2	1 .
Program of		1 200										
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	- १५ - १७ अस्य केन्द्र स्टिक्स	Mark Control	(2.084)	and are	Process.	t Paris		<u> </u>			H .	1
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Matrix Spike Results (spiked by laboratory)

compound	original Sample no	Spiked	Concer	itration		RELATIVE	LA BORATOR	CONTRO	7
	Sample no	Samole no	ADDED	FOUND	UNSPIKED	RECOVERY	LIMITS	LIMITS	<i>[</i> `
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* An asterisk indicates values outside control limits

Comments: Matrix spike results not provided in data package

Duplicate Analysis Results

Compouna	Type of duplica (Inter/Intra-Lal)	Lab Name	Concernation	Lab Name	conc.	Difference
2378-1200	phalal	Spirit	Run#13	RF=1.14 90	Run#2	RF=1.20	5.1%
2,3,7,8-7200	intelat	Spirit	Run#1	NO/DL=0.7,2	"Kun#213	17/2=0.20	gp6 —
2,37,8-700	interlab.		mo2-13/12.	NU/01:0.2700b	MOZ-13/ Emurochia	1.04 mb	2007
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	•						•
	•						
	ts:	_ S 0	utliers			:	

Controllimits:

Source of QC Limits:

*An asterisk indicates outliers.

Comments: Enurody re. was the asky lab to obtain a positive

result for this sample. Battelle and Envirodyne analyzed mozins.

Mead analyzed mozins field split The sample was homogenized in the field lusing blevler

before splitting consequently, mean sample should be very similar in compositor to mozins.

<u>waan a</u>	live hequirements	
A.J. Is - 2.Is 8 !	nomer Specificity Demonstrated in Documentation? (Y/N) <u>No</u> omer Specificity: Demonstrated in Documentation within hours to all positive sample runs? (Y/N) No Exceptions: <u>No duter provided</u> .	
B.L 320 Y/I	1322 Ion Ratio within QC Limits (-6787) For all positive NNA Exceptions No Positives in flux set at adoptory	es? 11:15
L Exc	ceptions No positives in this set, but surregate affected standard masses within 3 seconds of each than.	and
	I greater than 25 for each ion? (YIN) YES Exceptions: No Could not see height of surrogate in Run #1 Chromotogram, can tell from lakelled ones that it was >2.5 more since soperior time of surrogates and internal standard same as native	but hearby
daily stand	Lend. For Run #2 interinal standard was within 1 se immation Data east one confirmed per set of 24? (Y/N) (U) Exceptions.	and run.
2. High	resolution confirmation? (Y/N) Yes Comments High resolution contradicts TCDD found in EPA's initial analysis clan	ND ND
710	Envirolyre. Earlier roult may be artifactual or difference may be due. to in a scan confirmation? (IN) No	<u>Namogenei</u> ty
Com	ments - Duta sufficient to rule out the 2,378-13010 provided protocol was followed. Detection limit is roughly ve to one significant figure.	

<u>Calibration Standards</u>

Calibration do Exceptions:	a provided for	or 3 concentration	ion levels?(Y/N) / <i>(1</i> 0	nrigitAL (Red)
Linearity ver	ified within	working range?	(RRF<103 RSD)	Cantrot clatermen	ne-rodata
Caliboation Ch	eck data pro	rided for all so	ત્રી જે કહારા માત્ર પ્રાથમિક મોટા છે.) Incompletes	
Check Standard		±10% of mu	Hilevel calibratio	ns?(Y/N) Cunnot d	ctermina
Average RRE	from caliboatio	on used in all ca		Cupart delimine	
i, në Pangris, paster gjether dhim kësa. Në litetat kaset nga kësasë në pagrist	vitin destroit Cf	libration L	0G		
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Run#2:	~> Canno	estmated Sumplement	estimated RRF R	prh detection limit 10.20 detection lit Correct to one significant	nit reported. frust figure since than 0.50.

ORIGINAL (Red)

Appendix E

Sec. Opinion

CHAIN OF CUSTODY RECORD

Curtis Bidg., 6th & Walnut Sts. Philiadelphia: Pennsylvania 19106

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Received sample from Mike Nalipinski, stored in custody at office until religional

3-10878

CHAIN OF CUSTODY RECOR

Curtis Bidg., 6th & Walnut Sts. Philadelphia: Pennsylvania, 18106

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Cerija Bidy., 6th & Walnut Sts. Philadelphia, Pannsylvania, 19106

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Distribution: Original Accompanies Shipment; Copy to Goordinator Field Files.

A R. Slobadin received supples from Ti Shannon et 6/24 5100pm; samples Stored in custody at affice until Kellinguistal 3-1

FMC Agricultural Chemical Group
Baltimore MD

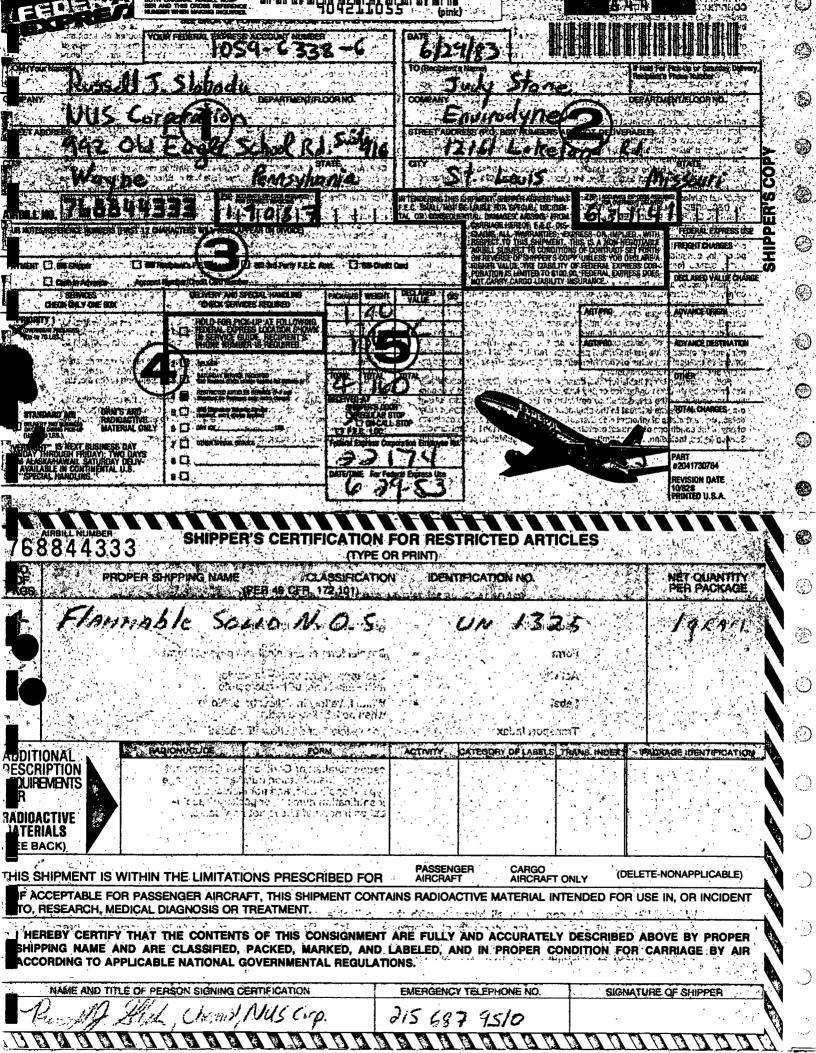
SECRECY AGREEMENT

Odietings

Many of the operations in our plant involve highly confidential information, which we are treating as trade secrets. Before allowing you into our plant, therefore, we must have your agreement to treat anything you observe as confidential. In no event will you reveal to anybody anything that you observe in our plant, whether new to you or not. Moreover, you agree to hold as confidential and not to disclose or use for any purpose any information that you receive or learn in our plant, which was not previously known to you, or which is not public knowledge, or which you do not receive from some other source at a future time.

I have read, understand, and agree to abide by the above listed agreement.

Signed _	Imale	Lenouich		Date	6/20/83	
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U.S. ENVIRONMENTAL PROTECTION AGENCY CLP Sample Management Office P.O. Box 818 — Alexandria, Virginia 22313 Phone: 703/357-2490 — PTS/557-2490

SAS Number 619 C

SPECIAL ANALYTICAL SERVICE

Sampling Offices	Sampling Date(s): Ship To:	For Lab Use Caly
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For Lab Use Only

on June 21, 1983, <u>C.A. Shahren</u> 5 are permission for terroce B. Shannon, of New Corp. to remove properly from their facility in the following contained: 15- one part Jack for 2,3,7,8- read analysis, and 24- eight owner jars.

C.a. Slakeon Facility Representative

6/21/83 Dok

Don G. Manni NUS Representative

6/31/82 Dak Appendix F

TABLE 1

DATA SUMMARY

Lab: Envirodyne Engineers, Inc.

Case:

619C

Page 1 of 2

Date: July 22, 1983

GC Column^a: SP-2330, 60 meters

SP-2340, 60 meters Wet Surrogate Extrac-We light TCDD D.L. Percent FRNC Sample Number Cleanup tion (grams) (ppb) (ug/kg) 320/322 Recovery 328^b 257 320 322 332 334 Number M-02-01 A,D 10.5 0.63 111 414 346 474 23601 M-02-02 Α 10.3 0.22 93 999 1106 1349 23525 M-02-03 Α 10.1 0.20 83 678 843 1032 23526 M-02-04 A.D 10.3 0.21 102 741 742 922 23624 M-02-04D A.D 10.1 0.14 101 629 662 767 23625 M-02-05 Α 10.1 0.06 85 1306 1550 1955 23529 M-02-06 A,D 10.8 0.15 95 1512 1564 1919 23602 M-02-07 A.D 10.6 0.19 91 528 591 738 23623 M-02-09 Α 11.1 0.47 92 810 902 1110 23533 M-02-10 A.D 10.4 0.14 98 1698 1698 2116 23604 M = 02 = 12A.D 10.7 0.69 93 193 203 272 23620 M - 02 - 13A,D 10.4 Interferences, is being re-extracted and reanalyzed; See FRNs 23536 and 23621. M-02-14 A.D 10.8 0.46 104 111 99 145 23622 M-02-14N Α 10.1 1.2 0.73 93 142 352 481 895 999 1208 23539d M-02-14Nª A.D 10.1 1.3 0.82 104 462 1103 1340 2618 4263 5330 6912 M-02-15 Α 10.1 3.3 0.82 94 336 723 880 639 706 23541d 845 M-02-15ª A 10.1 3.6 0.74 113 731 2376 3226 2042 3290 4340 6911^d M-02-16 10.1 3.1 0.79 95 682 1529 1933 1452 1556 1969 23542 M-02-16a Α 10.1 3.4 0.78 113 839 2881 3677 2531 4201 5271 6913 MB (solls) Α 0.246 83 646 797 989 23545 M-01-01 (powder) A.B 10.1 0.20 99 308 329 387 23547 MB (powder) A,B 0.84e 93 85 95 114 23548 M-02-08 (rinsate) -65 f 0.0399 95 1297 1436 1697 23532

TABLE 1

DATA SUMMARY

Page 2 of 2 Lab: Envirodyne Engineers, Inc. Date: July 22, 1983 Case: 619C GC Column^a: SP-2330, 60 meters SP-2340, 60 meters Wet Surrogate Extrac-Welght **TCDD** D.L. Percent FRNC Sample Number tion Cleanup (grams) (ppb) (ug/kg) 320/322 Recovery 257 320 322 328b 332 334 Number

Notes: MB = Method Blank

J = Jar Extraction

A,B,C = Cleanup Option from Method

FRN = File Refence Number

D = Duplicate

D.L. = Detection Limit

N = Native 2,3,7,8-TCDD Spike

CSamples with FRNs 23xxx analyzed on HP-5985 (SP-2340 column). Samples with FRNs 69xx were analyzed on HP-5993 (SP-2330 column). dSamples run just prior to these positives:

- •			
Positive Sample	FRN	Previous Sample	FRN
M-02-14N	23539	M-02-14	23538
M-02-15	23541	Mixed isomer standard	23540
M-02-15 confirmation	6911	Another project	6910

e Assumes 10 g sample.

91n ug/1.

a Samples were all initially analyzed on SP-2340 column. Positive values were confirmed on the SP-2330 column.

bCorrected for contribution by native TCDD (subtracted 0.009 of m/e 322).

fin milliliters

TABLE 1 - DATA SUPPLARY

Page 1 of 1

Date: 9/20/83 Lab: Envirodyne Engineers, Inc. GC Column: SP-2330, 60 meter 619C Rerun Case: Surrogate Wet PRN Percent Analytical Weight Extrac-Numbers 320 332 320/322 332/334 Time (grams) Sample Number tion Cleanup 7384 280 328 619C-H02-13

A.B.C.D = Cleanup Option from Method Notes: MB - Method Blank FRN - File Reference Number J = Jar Extraction

*Corrected for contribution by native TCDD (subtract 0.009 of m/e 322).

D = Duplicate

D.L. - Detection Limit

N = Native 2,3,7,8-TCDD Spike

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MB - Hethod Blank

P = Partial Scan

N - Native TCDD Spike D - Duplicate (Intralab) FB - Field Blank

H = High Resolution ND - Not Detected DL - Detection Limit

J = Jar Extraction

A,B,C = Cleanup Option (or any combination)

⁽¹⁾ Corrected for contribution by native TCDD (Subtract 0.009 of m/z 322).
(2) Based on 10 gram sample.

EXHIBIT II -COMPOUND LIST

SAMPLE IDENTIFIER: #13

COMPUCHEM SAMPLE NUMBER: 13228

2nd analysis

COMPOUND

RESULT (ppb) DETECTION LIMIT (ppb)

2378-TCDD

Not Detected

0.20

EXHIBIT II -COMPOUND LIST

SAMPLE IDENTIFIER: #13 COMPUCHEM SAMPLE NUMBER: 13228 1st analysis

COMPOUND RESULT (ppb) DETECTION LIMIT (ppb)
2378-TCDD Not Detected 0.70

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Appendix E

CHAIN OF CUSTODY RECORD

Curtis Bidg., 6th & Walnut Sts. Philadelphia, Pennsylvania 19106

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CHAIN OF CUSTODY RECORD

REGION 3
Curtis Bidg., 6th & Walnut Sts.
Philadelphia, Pennsylvania 19106

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Office of Enforcement

Curtis Bldg., 6th & Walnut Sts.

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. F	, .	Dist	ributi	on: Or	iginal Acco	mpanies SI	hipment; Co	py to Coordinat	or Field File						1				

* R. Slobada received samples from Ti Shannon at 6/24 5100pm, samples stored in custody at office until Relinguisted 3-10887

DA DUD I worked

ORIGINAL (Red)

Many of the operations in our plant involve highly confidential information, which we are treating as trade secrets. Before allowing you into our plant, therefore, we must have your agreement to treat anything you observe as confidential. In no event will you reveal to anybody anything that you observe in our plant, whether new to you or not. Moreover, you agree to hold as confidential and not to disclose or use for any purpose any information that you receive or learn in our plant, which was not previously known to you, or which is not public knowledge, or which you do not receive from some other source at a future time.

I have read, understand, and agree to abide by the above listed agreement.

Signed Joseph denouis	Date 6/20/83
Print Name DONALD SENOVICH	Witnessed By
Representing NUS CORP.	Dauge W. Pelmer

1313	SHIPPER: ALWAYS REFER TO BOTH ORIGINAL AIRBILL NUM-BER AND THIS CROSS REFERENCE NUMBER WHEN MAKING INQUIRIES.	1055 (pink)	7.6.8.8 4 4 3.3 3
DUP NO STATE OF THE PARTY OF TH	YOUR FEDERAL EXPRESS ACCOUNT NUMBER	DATE 6/29/83	
Your Name)	7 X 1 L 1	TO (Recipient's Name)	If Hold For Pick-Up or Saturday Delivery, Recipient's Phone Number
NY ATILIC C	DEPARTMENT/FLOOR NO.	COMPANY	DEPARTMENT/FLOORING
ADDRESS	STROTATION	Brig C C Con Stand of Part to be State State State	RE NOT DELIVERABLE)
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	PERSON SIGNING CERTIFICATION	EMERGENCY TELEPHONE NO.	SIGNATURE OF SHIPPER
Rend J. St.	ed Chemid NUS Corp.	215 687 9510	

SHIPPERS COPY

1. In tendering the shipment for carriage the shipper agrees to these TERMS AND CONDITIONS OF CONTRACT which no coent or employee of the parties may after and that this Federal Express Airbill is NON-NEGOTIABLE and has been prepared

Dy him for on hip behalf by Faderal Express!

2. The shipping agrees that carriage is subject to terms and conditions of contract stated herein and lines terms and conditions which are also stated in the most recent Federal Express Service Guide, which is available for inspection and incorporated into this contract by reference.

3. In tendering the shipment for carriage, THE SHIPPER WARRANTS that the ship-

ment is packaged adequately to protect the enclosed goods and to insure safe transportation with ordinary care and handling, and that each package is appropriately labeled and is in good order (except as noted) for carriage as specified. 4. When the destination of the shipment is not within the Federal Express air ter-minal zone as listed in the most recent Federal Express Service Guide, Federal Ex-

makes no commitment with respect to time of delivery of the shipment. 5. In the event of international carriage of any shipment hereunder, the rules relating to liability established by the Convention for the Unification of Certain Rules Relating to international Carriage by Air signed at Warsaw, Poland on October

12, 1929 shall apply to the carriage Insofar as the same is governed thereby.

8. Federal Transportation Excise Tax. Pursuant to Section 4271 of the Internal Revenue Code, a 5% tax on air transportation portion of the service and the ac-

cessorial services related thereto is included within the basic rate.
7. DECLARED VALUE AND LIMITATION OF LIABILITY. THE LIABILITY OF FEDERAL EXPRESS IS LIMITED TO THE SUM OF \$100.00 unless a higher value is declared för carriage herein and a greater charge pald at the rate of 30¢ per \$100.00 value. The maximum higher declared value is \$5000,00. Shipments containing items of extraordinary value, including, but not limited to, drawings, paintings, sculptures, porcelain, ceramics, furs, fur, clothing, fur trimmed clothing, jewelry, watches, gems, stones (precious or semi-precious, cut; or uncut), industrial damonds, costume jewelry, precious metals; gold, silver, (bullion, dust or precipitates), platinum (except as an integral part of electronic machinery), money, currency, coins, trading stamps, stocks, bonds, cash letters (or their equivalent) or other extraordinary valuable Items, are limited to a maximum declared value of \$500.00. When multiple packages are placed on a single airbill but the shipper has not specified the declared value of each individual package, the declared value for each individual package will be determined by dividing the total declared value on the air bill by the number of packages indicated on the airbill, subject to a \$100.00 minimum declared value per individual package. The liability of Federal Express is limited to the declared value of the shipment or the amount of loss or damage actually sustained, whichever is lower.

Federal Express is not liable for loss, damage, delay, mis-delivery or non-delivery not caused by its own negligence or any loss, damage, delay, mis-delivery or non-delivery caused by the act, default or omission of the shipper, consignee, or any other party who cialms interest in the shipment, the nature of the shipment or any defect, characteristic of inherent vice thereof; violation by the shipper or consignee of any of the conditions of contract contained in this airbill or in the Federal Express Service Guide, including, but not limited to, improper or insufficient packing, secur

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marking or addressing, or failure to observe any of the rules relating to shipments not acceptable for transportation or shipments acceptable only under certain conditions; acts of God, perils of the air, public enemies, public authorities acting with actual or apparent authority, authority of law, acts or omissions of customs or quarantine officials, riots, strikes or other local disputes, civil commotions, hazards incident to a state of war, weather conditions or mechanical delay of the alreraft or acts or omissions of any person other than FEC, including compliance with delivery instructions from the shipper or consignee. FEC shall not be itable for the loss of articles loaded and sealed in packages by the shipper provided the seal is unbroken at the time of delivery and the package retains its basic integrity; FEDERAL EXPRESS SHALL NOT BE LIABLE IN ANY EVENT FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS OR INCOME WHETHER OR NOT FEDERAL EXPRESS HAD KNOWLEDGE THAT SUCH DAMAGES MIGHT BE INCURRED.

8. CLAIMS, WRITTEN NOTICE OF LOSS DUE TO DAMAGE, SHORTAGE OR

DELAY MUST BE REPORTED BY THE SHIPPER WITHIN 15 DAYS AFTER THE DELIVERY OF THE SHIPMENT WRITTEN NOTICE OF LOSS DUE TO NON-DELIVERY MUST BE REPORTED BY THE SHIPPER WITHIN 180 DAYS AFTER AC CEPTANCE OF THE SHIPMENT OR CARRIAGE. Written notification will be considered to have been made if the shipper calls and notifies the Customer Services Department at 800/238-5355 (in Tennessee 800/542-5171) and as soon as practicable thereafter files a written notification. Documentation of all claims other than over-charge claims must be submitted in writing to FEO within finety (80, days after receipt of written notification. No claim for damage will be entertained until all transportation charges have been paid. The amount of a claim may not be deducted from the transportation charges. Receipt of the shipment by the consigned without written notification of damage on the delivery receipt shall be prima facie evidence that the shipment was delivered in good condition, except that in the case of claims for concealed damage which is not discovered at the time of delivery, the shipper shall notify FEC in writing as promptly as possible after the discovery thereof and in any event not later than 15 days from the date of delivery. The shipper must make the original shipping partons and packing available for inspection by FEC. Claims for overcharges and refunds must be made in writing to FEC within twelve (12) months of the billing date. All claims must be filed by the shipper

9: All shipments are subject to inspection by FEC; including but not limited to opening the shipment. However, FEC is not obligated to perform such inspection. 10. C.O.D. services are not available; and a C.O.D. shipment sent in error will be delivered as a normal pre-paid or collect shipment.

11. Federal Express carries no cargo liability insurance but maintains a separate fund for the satisfaction of cargo claims which may arise out of the carriage of cargo pursuant to the conditions of contract contained herein and in the most re-Federal Express Service Guide.

12. Notwithstanding the shipper's instructions to the contrary, the shipper shall be primarily liable for all costs and expenses related to the shipment of the package and for costs incurred in either returning the shipment to the shipper or warehous ing the shipment pending disposition.

13. Saturday Delivery: Recipient's phone number is required.

68844333

HIGHER AND ERRYTH

RADIOACTIVE MATERIAL SHIPMENT INFORMATION

Carwind has

Radionuclide Element and mass number Form Special form or chemical and physical form Use appropriate units - Ci -curie. Activity mCi - millicurie, uCi - microcurie Label White I, Yellow II, Yellow III, or None when no label required. Transport Index For Yellow II and Yellow III labeled packages only Package Identification

NRC Certificate of Compliance Identification number; or Certificate of Competent Authority identification number; or package type, if applicable, and not included in identification number; or package specification if none of above not applicable.

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73200 S.MARTI

WARNING: Failure to comply in all respects with the applicable regulations of the Department of Transportation, 49 CFR, Parts 100-199 and, for international shipments, the IATA Restricted Articles Regulations may be a breach of the applicable law, subject to legal penalties. This certification shall in no circumstance be signed by an IATA Cargo Agent or a consolidator for international shipments.

ेर प्रिकार एक विशेष देवेतुम्बारक करनाइच्या देवर ठक्रवाराक्ष स्थाप प्रकार केर्या प्रकार वेपाली प्रशासिक है। स्थ

U.S. ENVIRONMENTAL PROTECTION AGENCY

CLP Sample Management Office

P.O. Box 818 - Alexandria, Virginia 22313 Phone: 703/557-2490 - FTS/557-2490

SAS Number 6190

SPECIAL ANALYTICAL SERVICE **PACKING LIST**

Sampling Office:	Sampling Date(s): Ship To:	For Lab Use Only
III	6/21/83 Envrodyne	
Sampling Contact:	Date Shipped: 12/6/ Lakeland Rd.	Date Samples Rec'd:
T. Shappen	6/29/83 St. Lavis, Mo. 63/4/	
(name)	Site Name/Code:	Received By:
215-687-9510	m-02 Attn: Judy Stone	
(phone)		
Sample Numbers	Sample Description i.e., Analysis, Matrix, Concentration	Sample Condition on Receipt at Lab
1. m-02-01	2,3,7,8- TCDD Analysis/Solid/Low	
2. 1-02-03	2,3,7,8- TCDD Analys: 1/501:4/ Low	
3. m - 02 - 03	2,3718 - TODA Arolystepald Com	
4. m-02-04	2,3,7,8- TCDD Analysis / Solid/ Con	
5. 0-07-05	2.3,7,6- TCOD Analysis Solid / low	
6. m-02-06	2,3,7,8- 7con Analysis/ Solid/ Low	
7. m-02-07	3,7,8- 7000 Analys: 1 Solid/ Con Agreens (TAD)	
8. m-62-08	2,3,7,8- FLAD Analysis/ stid/ Lou	
9. m-02-09	2378- TCDD Anysol Solicy Low	
0. m-02-10	23,7/8- TCOD Analysis/ Solid/ Low	
11. 1-02-12	7,3,7,8-TCDD Analysis/ 501:4/ low	
12. m - 02 - 13	3.3.7.8 - TCDD Andys/ Solid/ Low	
13. 1-02-14	7.3.7,5 - +COD Anelys: / Solid / Cow	
14. m- 02 - 14	2,378-7000 Analys, /sol-a/low/"To	
15,	Be saked By laboratory"	
16. m-01-01	2,3,7,8-7(0) Apalysis/ Again High	
17.	Note: Samle & Lexachlorophen gouder	
18. M-02-15	2,3,7,8-TCDD Analysis/ Solid / Low	
19. m-02-16	2378-TCDO Analysis/Solid/Low	
20.		
		For Lab Use Only

00 340	e 21 1983,	C.A. Shahe	en 5 ave
permission	for Terra	ce A. Shanno	n of NUS Corp.
to remove	pro perly	from their	tacility in
the follow	ving conta	in ars: 15-	one post sens
for 2,3,7), f - TCOD a	nalysis, and	24- e:34+
	4.		
			6/21/83

C.O. Shakeon 6/21/83 Facility Representative Date

Du Ce. Mann 6/31/82

NU Representative Dak

Appendix F

Battelle Labı Date: __10/19/83 GC Column: CP_S11-88 Case: Shipment: Average Native RRF: 0.95 Average Surrogate RRF: Cleanup Extraction Method Option C-13 Native Surrogate (1) m/z 320 m/z 332 m/z 🖔 m/z m/z m/z m/z m/z m/z 334 PPB m/z 322 332 334 Sample Analytical Percent 320 322 257 328 Number Gm. Wt. TCDD D.L. Date Time Area Ratio Area Ratio Accuracy Comments area area area area area. area 13228 JB 10.8 10/19 UNABLE TO ANALYZE DUE TO PRECIPITATE 10.8 10/19 M-02-13 J B 33.53 M-02-14 J B ND 10/19 --.80 120 31.90 7711.42 7091.71 8917.86 10.9 .02 .95 M-02-16 J B 10.4 3.47 ---10/19 --.78 .78 121 8950.35 11533.43 7235.18 6499.87 8283.64 .78 .80 4819.68 6141.26 8358.66 7767.68 M-02-14N J B 10.7 1.58 10/19 --119 9703.96 10/19 --.77 .81 119 27.01 35.16 7026.23 6582.39 8158.30 J B 0.01 10.0 M-02-13 J B .83 10/19 --.17 .76 120 11.78 68.82 3049.33 2798.36 3544.60 . 1.0 ND

MB = Method Blank
P = Partial Scan

P = Partial Scan N = Native TCDD Spike

FB = Field Blank

D = Duplicate (Intralab)

H = High Resolution

ND = Not Detected

DL = Detection Limit

J = Jar Extraction

A,B,C = Cleanup Option (or any combination)

ORIGINAL (Red)

⁽¹⁾ Corrected for contribution by native TCDD (Subtract 0.009 of m/z 322).

⁽²⁾ Based on 10 gram sample.

EXHIBIT II -COMPOUND LIST

SAMPLE IDENTIFIER: COMPUCHEM SAMPLE NUMBER: 13228

2nd analysis

COMPOUND

2378-TCDD

RESULT (ppb)

DETECTION LIMIT (ppb)

Not Detected

0.20

EXHIBIT II -COMPOUND LIST

SAMPLE IDENTIFIER: #13
COMPUCHEM SAMPLE NUMBER: 13228

1st analysis

COMPOUND

RESULT (ppb)

DETECTION LIMIT (ppb)

2378-TCDD Not Detected

0.70

Lab: Envirodyne Engineers, Inc.

619C Rerun Case:_

Page 1 of 1

9/20/83

GC Column: SP-2330, 60 meter

	Extrac-	Wet Weight	TCDD (ug/kg)	D·L. (ug/kg)	Analytical Date Time 320/3	2 332/334	Surrogate Percent Accuracy	257	· 320	322	328 ^a	332	334	FRN Numbers
Sample Number 619C-M02-13		nup (grams	1.0	<u>(ug/xg)</u>	8/26 0040 0.6		80	58	87	130	250	280	328	7384

Notes: MB = Method Blank J = Jar Extraction A, B, C, D = Cleanup Option from Method FRN = File Reference Number

D = Duplicat
D.L. = Detection Limit

N = Native 2,3,7,8-TCDD Spike

^aCorrected for contribution by native TCDD (subtract 0.009 of m/e 322).

TABLE 1

DATA SUMMARY

Lab: Envirodyne Engineers, inc.

Page 1 of 2

Date: July 22, 1983

Case: 619C

GC Column^a: SP-2330, 60 meters

			1.0 . A		•								SP-234	0, 60 met	ers
	Extrac		Wet Weight	TCDD	D.L.		Surrogate Percent					•		FRNC	
Sample Number	tion	Cleanup	(grams)	(ppb)	(ug/kg)	320/322	Recovery	257	320	322	328 ^b	332	334	Number	
M-02-01		4.0				ı									
M-02-01 M-02-02	J	A,D	10.5	-	0.63	-	111	-	-	• -	41 4	346	474	23601	*
	J	A .	10.3	-	0.22	~	93	-	-	-	999	1106	1349	23525	
M-02-03	J	A	10.1	-	0.20	-	83	-	-	-	678	843	1032	23526	
M-02-04	J	A,D	10.3	-	0.21		102	-	-		741	742	922	23624	,
M-02-04D	J	A,D	10.1	-	0.14	-	. 101	-	-	-	629	662	767	23625	
M <i>-</i> 02-05	J	Α	10.1	-	0.06	-	85	-	_		1306	1550	1955	23529	
M-02-06	J	A,D	10.8	-	0.15	-	95	-	· _	_	1512	1564	1919	23602	
M-02-07	J	A,D	10.6	-	0.19	-	91	_	_	_	528	591	738	23623	
M-02-09	J	Α	11.1	-	0.47	-	92	_	_	_	810	902	1110	23533	
M-02-10	J	A,D	10.4	-	0.14	-	98	~-	-	_	1698	1698	2116		
M-02-12	J	A,D	10.7	_	0.69	_	93	_	_		193	•		23604	
M-02-13	J	A,D	10.4	_		rences is	being re-ext	rected	and moon	- 		203	272	23620	
M-02-14	J	A,D	10.8	_	0.46	-	104		and I ban	aryzed;		23536 and			
M-02-14N	J	A	10.1	1.2	-	0.73	93	 142	750	404	111	99	145	23622	
M-02-14Na	J	A,D	10.1	1.3	_	0.75			352	481	895	999	1208	23539d	
M-02-15	J	A .	10.1	3.3	_	0.82	104	462	1103	1340	2618	4263	5330	6912	
M-02-15a	1	Ä	10.1	3.6			94	336	723	880	639	706	845	23541 ^d	
M-02-16	1	Ā	10.1		-	0.74	113	731	2376	3226	2042	3290	4340	6911 ^d	
M-02-16 ^a	,			3.1	-	0.79	95	682	1529	1933	1452	1556	1969	23542	
MB (soils)	J	A	10.1	3.4	-	0.78	113	839	2881	3677	2531 %	4201	5271	6913	
	J	Α	-	-	0.24 0	-	83	-	~ ′	-	646	797	989	23545	
M-01-01 (powder)	J	A,B	10.1	-	0.20	· =	99	-	-	-	308	329	387	23547	
MB (powder)	J	A,B	-	-	0.84 ^e	-	93	– i -,	-	-	85	95	114	23548	
M-02-08 (rinsate) -	Α	65 ^f	-	0.0399		95	- ,	-	-	1.297	1436	1697	23532	0

ORIGINAL

TABLE 1

DATA SUMMARY

Lab: Envirody	ne Englneers, Inc.								Page 2 of	2	Date:	July	22, 1983
Case: 619C		_						•		GC	•		0, 60 meters
		Wet				Surrogate							0, 60 meters
Sample Number	Extrac- tion Cleanup	Welght (grams)	TCDD (ppb)	D.L. (ug/kg)	320/322	Percent Recovery	257	320	322	328 ^b	332	334	FRN ^C Number

Notes: MB = Method Blank

J = Jar Extraction

A,B,C = Cleanup Option from Method

FRN = File Refence Number

D = Duplicate

D.L. = Detection Limit

N = Native 2,3,7,8-TCDD Spike

 $^{
m d}$ Samples run just prior to these positives:

Positive Sample	FRN	Previous Sample	FRN
M-02-14N	23539	M-02-14	23538
M-02-15	23541	Mixed isomer standard	23540
M-02-15 confirmation	6911	Another project	6910
10			

eAssumes 10 g sample.

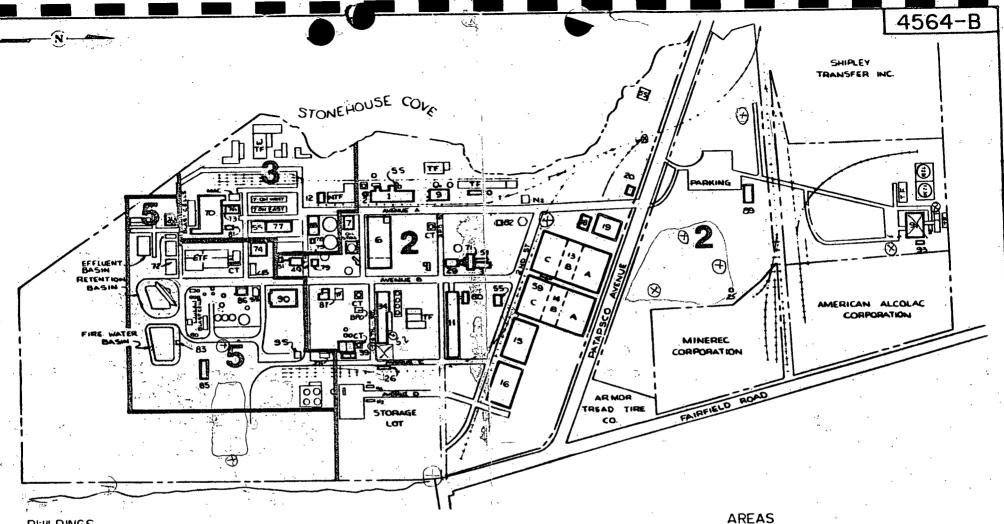
^aSamples were all initially analyzed on SP-2340 column. Positive values were confirmed on the SP-2330 column.

 $^{^{}m b}$ Corrected for contribution by native TCDD (subtracted 0.009 of m/e 322).

CSamples with FRNs 23xxx analyzed on HP-5985 (SP-2340 column). Samples with FRNs 69xx were analyzed on HP-5993 (SP-2330 column).

fin milliliters

gin ug/i.



BUILDINGS

- POWER HOUSE
- STACK
- ETHION & BUTOKIDE LLDG.
- PASS CONVEYOR & STORAGE BLDG.
- DIALLYL PHTHALATÉ BLDG.
- PACKAGING BLDG.
- CENTRAL SHOP & STOREROOM
- FIRE PUMP HOUSE
- 13-A WAREHOUSE
- 13-B CARPENTER SHOP
- 13-C WAREHOUSE & SHIPPING DEPT.
- 14-A STORAGE
- 14 8 STORAGE
- 14-C DRUM RECOVERY
- 15 VAREHOUSE

- WAREHOUSE .
- MISC. STORAGE
- MAIN OFFICE BLDG.
- GATE HOUSE
- BOOSTER PUMP HOUSE
- ANHYDROUS AMMONIA
- HCI LOADING BLDG.
- CONTROL LAB
- PPODUCTION OFFICE
- 34 DV ESTER
- 39 LOAD CENTER
- STORAGE
- STORAGE
- SODIUM ALKYLATES
- SODIUM STORAGE

- LOCKERS
- - CAFETERIA
 - PAINT STORAGE
 - 7-OH PLANT T

 - CONTROL LAB
 - INCINERATOR AREA
 - 7 OH CONTROL ROOM
 - 7-OH STORE ROOM
 - EFFLUENT CONTFOL
 - ROOM
 - #2-7-OH CONTROL
 - LOCKER ROOMS
 - 7-OH SHOP
 - CL2 CONTROL ROOM
 - FIRE PUMP HOUSE "
 - LOCKERS

- REFRICENATOR BLDG.
 - LOCKERS
- FIRE PLIMP HOUSE #2
- T-OH DAY CHEMICAL BLDG PLANT II 7-OH SHOP 4
- WAREHOUSE
- MCC. "3-7-OH CONTROL
- LOCKER ROOM
- LOCKERS
- CALGON CARBON BLDG.
- POUNCE STORAGE
- OPERATIONS BLDG. 90 POUNCE PLANT 91
- ELEC. CONTROL ROOM
- COOLING TOWER CT
- TANK FARM TF
- SUB STATION

- AREA & ACTIVE SHOP, OFFICES, BUILDINGS 1,479491 LAB , WAREHOUSES & HYDROGEN STATION
- AREA 3 ACTIVE NORTH & WEST TANK FARMS, 7-OH PLANT I MAC & HCI PLANTS PLANT II CONTROL
 - ROOM, STEES IAK, IBZ, III, IV ETC.
- AREA 5 ACTIVE 7-OH PLANT III , PLANT III CONTROL ROOM. WASTE BASINS, HCI STORAGE, INCINERATOR COOLING TOWERS & EAST TANK FARM ETC.

MAINTENANCE AREAS FMC-BALTIMORE PLANT

REV. 4/5/BR

